NUEXCO

Monthly Report

June 1991 Number 274

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Soviet Union's Uranium Trade Policy. 24

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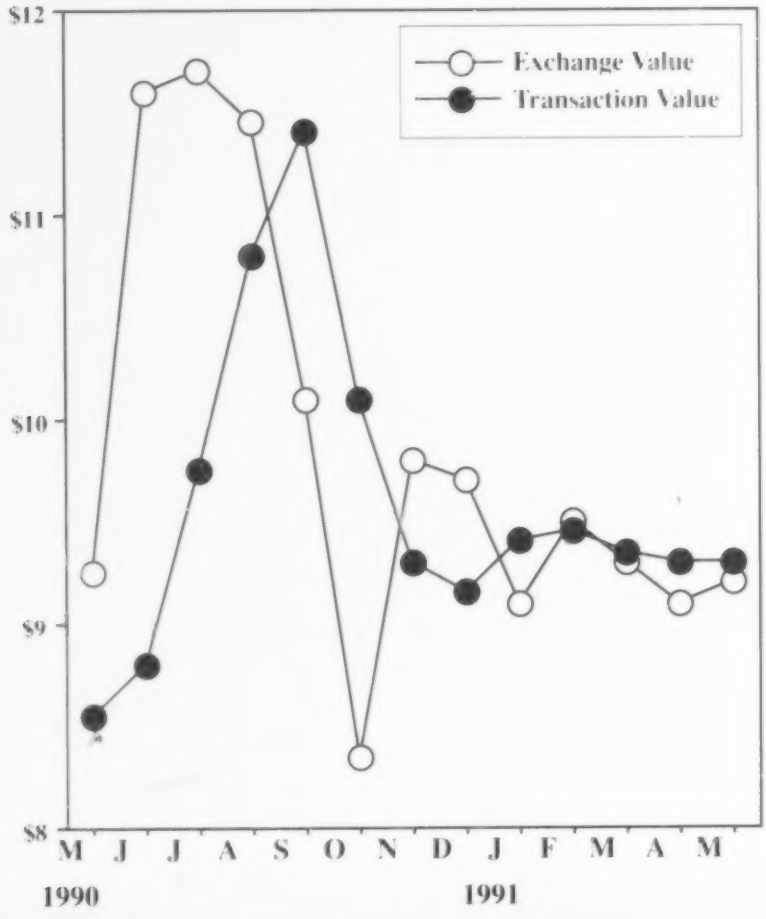

NUEXCO

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ISSN 0742-4582

NUEXCO Monthly Report

June 1991
No. 274

Published by:
NUEXCO
Three Park Central
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  In today's market, it often seems that virtually no discussion can proceed without some mention of the so-called Soviet uranium stockpile. James E. Vaughan, in his speech to the World Nuclear Fuel Market Conference, discusses some perceptions of this stockpile.
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To Our Readers

NUEXCO will be hosting a hospitality suite at the US Council for Energy Awarness International Enrichment Conference to be held June 23-26 in Washington, D.C. We look forward to seeing you there.

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Market Values Summary

NUEXCO Market Values	This Report May 31, 1991	Last Report April 30, 1991	12 Months Ago May 31, 1990
EXCHANGE VALUE[1]	**$9.20**/lb equivalent U_3O_8	$9.10	$9.25
UF_6 VALUE[2]	**$27.60**/kg U as UF_6	$27.25	$25.50
LOAN RATE[3]	**3.5%** /annum	3.5%	3.5%
CONVERSION VALUE[4]	**$1.50**/lb U as UF_6	$1.45	$1.45
SWU VALUE[5] **(0.3 w/o tails assay)**	**$54**/SWU	$52	$50
TRANSACTION VALUE[6]	**$9.30**/lb equivalent U_3O_8	$9.30	$8.55
Transactions	**21**	22	27
Months	**3**	3	3
Millions of Pounds	**5.3**	5.6	9.9

DEFINITIONS

1 The **Exchange Value** is NUEXCO's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.

2 The **UF_6 Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.

3 The **Loan Rate** is NUEXCO's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.

4 The **Conversion Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.

5 The **SWU Value** is NUEXCO's judgment of the price at which spot and near-term transactions for significant quantities of enrichment services could be concluded as of the date indicated.

6 The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:

a) Transactions closed within the previous three month period for which delivery is scheduled within one year of the transaction date;

b) At least ten transactions;

c) Transactions involving a sum total of at least 2 million pounds equivalent U_3O_8.

DERIVATIONS AND COMMENTS

- All **Market Values** are expressed in terms of US$.

- All **Market Values** are based on:
  - Data from recently completed transactions.
  - Data from pending transactions.
  - Firm bids to buy or borrow, and firm offers to sell or lend.
  - Prices purchasers or rate borrowers have expressed a willingness to pay, but for which NUEXCO is not aware of firm bids to buy or borrow and prices sellers or rates lenders have expressed a willingness to accept, but for which NUEXCO is not aware of firm offers to sell or lend.

- Prices associated with deliveries under older renegotiated contracts or other than arm's-length transactions are not included in the determination of these **Market Values**.

- In the determination of prices, NUEXCO does not consider charges for transportation other than that customarily provided by suppliers.

- The prices of services or materials delivered under long-term contracts with primary suppliers are not considered in the determination of the listed values.

- For the **SWU Value**, NUEXCO converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the NUEXCO **Exchange Value** and **Conversion Value** determined as of the same date.

- In calculating the **Transaction Value**, NUEXCO does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future **Exchange Values** or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it can not currently be determined.

- The sample time for the **Transaction Value** is extended as necessary to satisfy the minima for the number of transactions and quantity of material. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

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MARKET REVIEW

MAY MARKET REVIEW

(as of May 31, 1991)

OVERVIEW

The uranium market strengthened slightly during the month of May, and the May 31 Exchange Value edged upward to $9.20 per pound U_3O_8. The UF_6 Value also increased, climbing to $27.60 per kgU as UF_6. Nine near-term uranium sales were reported for 1.7 million pounds equivalent U_3O_8. Seven sales involved concentrates and two involved UF_6; no enriched uranium product (EUP) sales were reported.

Year-to-date market volume now exceeds ten million pounds equivalent U_3O_8 (**Table 1**). Although the market strengthened somewhat during May, market volume decreased from April's level of 3.8 million pounds, as demand slackened.

The Loan Rate remained unchanged at 3.5 percent per annum. One loan for more than one million pounds equivalent U_3O_8 was reported. The Conversion Value moved up $0.05, to $1.50 per pound U as UF_6; one near-term and one long-term conversion transaction were reported.

The SWU Value increased two dollars, to $54 per SWU. Only one transaction for a small quantity of SWU was reported in the May enrichment market.

Table 1
NEAR-TERM URANIUM SALES SUMMARY

	May 1991		Year-to-Date	
	No. of Sales	Volume[1]	No. of Sales	Volume[1]
Concentrates	7	1.4	26	4.8
Natural UF_6	2	0.3	11	3.6
EUP	0	0.0	8	2.1
Total[2]	**9**	**1.7**	**45**	**10.5**

[1] million pounds equivalent U_3O_8
[2] columns may not total due to independent rounding

NATURAL URANIUM AND CONVERSION

The **Exchange Value** increased $0.10, to **$9.20** per pound U_3O_8. Uranium prices firmed through the middle of May as sellers increased their offering prices, but lost momentum during the final week of the month in the face of weakening demand. Abundant supply, particularly in the form of concentrates, also contributed to the month-end softness in the market. Also impacting the market was a widening gap between the prices offered by sellers and the prices discretionary buyers were willing to pay; this led some discretionary buyers to exit the market temporarily in the hope of lower prices in the future.

Seven near-term concentrates sales were reported, totalling over 1.4 million pounds equivalent U_3O_8. Utilities, intermediaries, and producers each made purchases. Unlike past months, when most transactions involved US entities, May's seven concentrates transactions involved participants from Asia, Australia, Europe, and North America.

* * *

The **UF_6 Value** also moved up slightly, registering a $0.35 increase, to **$27.60** per kgU as UF_6. UF_6 is now selling for $0.25 more than the sum of the values of its component parts—concentrates and conversion. Rather than an indication of a premium for UF_6, the differential reflects a small discount for concentrates due to their abundance in the market, and also the increasing price of conversion services. Only two natural UF_6 sales were reported; US intermediaries sold over 250 thousand pounds equivalent U_3O_8.

* * *

In the long-term uranium market, three sales were reported. Asian and US buyers purchased a total of two million pounds equivalent U_3O_8 in the form of concentrates, for delivery during the period 1991-1996.

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The **Transaction Value** was unchanged at **$9.30** per pound U_3O_8, based on 21 transactions over 3 months involving 5.3 million pounds equivalent U_3O_8.

* * *

Active uranium supply increased by over one million pounds, to **7.1** million pounds equivalent U_3O_8. **Active uranium demand** decreased slightly, dropping 55 thousand pounds, to **1.4** million pounds equivalent U_3O_8 (**Table 2**). The new **supply-demand ratio** is **5.1**.

* * *

The **Loan Rate** remained at **3.5** percent per annum. Only one loan was reported in May, in which an intermediary borrowed over one million pounds of concentrates.

* * *

The **Conversion Value** climbed $0.05, to **$1.50** per pound U as UF_6. This is the first change in the Conversion Value in 14 months, and ends its longest unchanged streak since the Conversion Value was first published in 1981. The strengthening is a result of reduced competition among conversion sellers recently, and the fact that UF_6 supplies overhanging the market have diminished. One near-term conversion sale was reported, in which an intermediary purchased a moderate quantity of conversion services at a price near the May 31, 1991 Conversion Value. In addition, one long-term conversion sale was reported, as a US utility purchased over 1.5 million pounds U for delivery during 1993-1997.

ENRICHMENT SERVICES AND ENRICHED URANIUM PRODUCT

The enrichment market strengthened during May, consequently, the **SWU Value** rose two dollars, to **$54** per SWU. Several factors prompted the price rise, including less aggressive sellers, more discretionary buyers, and the fact that enrichment supplies generally are located in Europe, while most uncovered demand is in the USA. Near-term competition was less aggressive among sellers, in particular traders, as readily available near-term SWU supply has tightened in recent months. Only one near-term transaction was reported in May, in which a US utility purchased a small quantity of SWU for delivery during first quarter 1992.

Table 2
NEAR-TERM SUPPLY/DEMAND SUMMARY

	Active Supply[1]	Active Demand[1]
• Uranium (thousand lbs equivalent U_3O_8)	7,130	1,400
• Supply/Demand Ratio:	5.1	
• Loan (thousand lbs equivalent U_3O_8)	5,900	0
• Conversion (thousand lbs U as UF_6)	700	0
• SWU (thousand SWUs)	380	175

[1] Supply and Demand tables in the Market Review section of this Report provide details for each category.

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MARKET REVIEW

A number of buyers entered the long-term SWU market during May, and at month end, at least ten US utilities were evaluating long-term SWU offers. Many of these potential buyers entered the market to evaluate alternative sources of SWU supply in light of DOE's recent marketing efforts, which have tended to focus on those customers who are currently 70 percent committed during the 1996-1998 time period.

Table 3
ENRICHMENT PRICES
(May 31, 1991)

Prices	This Month Report 274	Last Month Report 273	12 Months Ago Report 262
NUEXCO SWU Value ($US per SWU)	54	52	50
US DOE SWU prices: ($US per SWU)			
USEC	117.85[1]	117.85[1]	117.85[1]
AFC	153.00[2]	153.00[2]	153.00[2]
Requirements	157.00[2]	157.00[2]	157.00[2]
Incentive Price (IP2)[3]	100.60[3]	100.60[3]	90.00[4]
Calculated worth of enriched UF_6[5]: ($US per KgU as UF_6)			
2.0 w/o U^{235}	205	200	198
2.5 w/o U^{235}	284	276	273
3.0 w/o U^{235}	365	355	351
3.5 w/o U^{235}	447	436	430
4.0 w/o U^{235}	531	517	510
4.5 w/o U^{235}	616	600	591

[1] Effective 10/1/89 to 9/30/91.
[2] Effective since 10/1/84.
[3] IP2: Effective 10/1/90 to 9/30/91, for up to 30% of annual requirements.
[4] Used Incentive Price IP1 – effective 10/1/86 to 9/30/90, for up to 30% of annual requirements.
[5] Calculated using the NUEXCO Exchange Value, Conversion Value, SWU Value and 0.30 w/o U^{235} tails assay.

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RECENT TRANSACTIONS

Uranium Sales [1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8)	Price Within Percentage Range [2] of Current Exchange or UF_6 Value	Buyer	Seller	Remarks
5108	1995	301-600	R	Intermediary	Intermediary	
5109	1995	301-600	R	Utility	Intermediary	
5110	1991-1996	1,001-3,000	See Remarks	Utility	Producer	Price Related to Market
5111	1991	301-600	See Remarks	Producer	Producer	Price Related to Market
5114	1991	50-100	98-102	Intermediary	Producer	
5115	1991	101-300	98-102	Utility	R	
5118	1991	Less than 50	98-102	Producer	Producer	
5121	1991	101-300	98-102	Utility	Intermediary	UF_6
5122	1991	50-100	98-102	Utility	R	
5123	1991	301-600	R	Intermediary	Producer	
5124	1991	101-300	98-102	Intermediary	Intermediary	UF_6
5127	1991	50-100	98-102	Producer	Intermediary	

R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.

[2] The ranges *Below 90, 90-97, 98-102, 103-110, Above 110*, represent percentages (rounded to whole numbers) of the appropriate current Exchange Value or UF_6 Value. The endpoints of each range are included within that range.

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RECENT TRANSACTIONS

Natural Uranium Loans[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds equivalent U_3O_8)	Price Within Percentage Range[2] of Current Loan Rate	Borrower	Lender	Remarks
5120	1991	1,001-3,000	Above 110	Intermediary	R	

Conversion Sales[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds of U equivalent)	Price Within Percentage Range[2] of Current Conversion Value	Buyer	Seller	Remarks
5113	1993-1997	1,001-3,000	R	Utility	Convertor	
5117	1991	101-300	98-102	Intermediary	Convertor	

Enrichment Sales[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity[3] (thousand SWU)	Price Within Percentage Range[2] of Current SWU Value[4]	Buyer	Seller	Remarks
5126	1992	50-100	103-110	Utility	Intermediary	

R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

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2 The ranges *Below 90, 90-97, 98-102, 103-110, Above 110*, represent percentages (rounded to whole numbers) of the appropriate current Market Value. The endpoints of each range are included within that range.

3 If tails assay is unknown or unspecified, NUEXCO's calculation of SWU quantity assumes 0.30 w/o tails assay.

4 Prices are usually normalized to 0.30 w/o tails assay. When prices and SWU values are expressed as discounts from a reference price (e.g., X dollars less than DOE's USEC base price at time of delivery), the percentage price range is based on the discounted prices, not on the reference price.

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SUPPLY AND DEMAND

Uranium Supply

NUEXCO Project Number	Quantity (Thousand Pounds equivalent U_3O_8) Spot or Near-term[1]	Intermediate or Long-term[2]	Delivery Period	Remarks
AVAILABLE FOR SALE:				
ACTIVE				
90-1078A	700	1,045 per year	1991-1993	UF_6e
90-1227	500	—	1991	
90-1231	500	500 per year	1991-1995	
90-1501	3,000	1,000 per year	1991-1995	U_3O_8/UF_6
91-1060	100	—	1991	
91-1502	500	—	1991	
91-1503A*	1,330	2,670	1991-1993	UF_6e
91-1505*	500	—	1991	
TOTAL	**7,130**			
INACTIVE	**3,600**			
AVAILABLE FOR LOAN:				
ACTIVE				
90-1230	1,000	—	—	U_3O_8
91-1034	1,000	—	—	U_3O_8
91-1084	3,900	—	—	U_3O_8
TOTAL	**5,900**			
INACTIVE	**1,000**			

*New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes material deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: *none*
Active Projects removed since last month: 91-1016, 91-1504

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SUPPLY AND DEMAND

Uranium Demand

NUEXCO Project Number	Quantity (Thousand Pounds equivalent U_3O_8) Spot or Near-term [1]	Intermediate or Long-term [2]	Delivery Period	Remarks
INQUIRIES TO PURCHASE:				
ACTIVE				
90-1100A	45	—	1991	UF_6e
90-1224A	300	11,700	1991-2001	U_3O_8/UF_6/UF_6e
91-1010A	85	—	1991	UF_6e
91-1106*	405	—	1991	
91-1112*	160	—	1991-1992	U_3O_8/UF_6
91-1122*	15	—	1991	
91-1127A*	390	—	1992	UF_6e
90-1291	—	100 per year	1991-1995	
91-1014A	—	6,800	1992-2001	UF_6e
91-1017	—	300 per year	1995-2000	
91-1054	—	1,200	1992-1997	
91-1064	—	230 per year	1993-1997	U_3O_8/UF_6
91-1093	—	200 per year	1994-1996	
91-1094A	—	1,700 per year	1994-1995	UF_6e
91-1102*	—	1,000 per year	1992-1995	– U_3O_8/UF_6
91-1108*	—	400 per year	1993-1997	U_3O_8/UF_6
91-1110*	—	90	1992	UF_6
91-1115*	—	250 per year	1992-1994	
91-1118*	—	300 per year	1993-1998	U_3O_8/UF_6
TOTAL	**1,400**			
INACTIVE	**1,400**			

INQUIRIES TO BORROW: *No inquiries to borrow are reported*

* New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes material deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: *none*
Active Projects removed since last month: 91-1076A, 91-1100, 91-1101

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SUPPLY AND DEMAND

Conversion Supply And Demand

NUEXCO Project Number	Quantity (Thousand Pounds U as UF6) Within 3 Years [1]	Beyond 3 Years [1]	Delivery Period	Remarks
AVAILABLE FOR SALE:				
ACTIVE				
91-1500	300	—	1991	
91-1501	400	—	1991	
Total	**700**			
INACTIVE	*None reported*	—		

INQUIRIES TO PURCHASE: *No inquiries to purchase are reported*

* New or revised since last month.

[1] Measured from the date of this Report.

Active Projects reclassified as Inactive since last month: *none*
Active Projects removed since last month: 91-1085

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SUPPLY AND DEMAND

SWU Supply And Demand

NUEXCO Project Number	Quantity (Thousand SWUs) Spot or Near-term [1]	Quantity (Thousand SWUs) Intermediate or Long-term [2]	Delivery Period	Remarks
AVAILABLE FOR SALE:				
ACTIVE				
90-1078B	200	435 per year	1991-1993	UF6e
91-1008*	130	—	1991	
91-1032*	50	—	1991	
90-1500	—	1,000	1991 on	
Total	**380**			
INACTIVE	**1,000**			
INQUIRIES TO PURCHASE:				
ACTIVE				
90-1100B	15	—	1991	UF6e
91-1010B	20	—	1991	UF6e
91-1127B*	90	—	1992	UF6e
91-1128*	50	—	1991	
90-1181	—	1,500	1996-2001	
90-1196	—	60 per year	1995 on	
90-1224B*	—	1,920	1991-2001	UF6e
90-1301	—	1,000 per year	1995-2000	UF6e
91-1014B	—	1,770	1992-2001	UF6e
91-1027	—	55 per year	1996-2000	
91-1063	—	15 per year	1995-1998	
91-1066	—	320	1995-2000	
91-1083	—	150 per year	1996-1998	
91-1094B	—	385 per year	1994-1995	UF6e
91-1105*	—	205	1996-2001	
91-1109*	—	150 per year	1992-1996	
91-1113*	—	710	1996-2000	
91-1120*	—	120	1996-1999	
91-1121*	—	50	1996-1998	
Total	**175**			
INACTIVE	**180**			

* New or revised since last month.

[1] For delivery within one year, measured from the date of this Report. This category excludes SWU deliverable within one year under other than spot or near-term contracts.

[2] For delivery beyond one year, measured from the date of this Report.

Active Projects reclassified as Inactive since last month: 91-1069
Active Projects removed since last month: 90-1028, 91-1055

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MARKET VALUES EXPRESSED IN SELECTED CURRENCIES

Exchange Value[1]

Country (currency)	per lb equivalent U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)
Australia (dollar)	12.09	11.64	11.98	31.43	30.25	31.14
Belgium (franc)	329.63	319.07	320.18	856.97	829.52	832.40
Canada (dollar)	10.53	10.49	10.88	27.38	27.28	28.28
EC (ecu)	7.72	7.65	7.54	20.06	19.89	19.59
Finland (markka)	38.11	36.30	36.40	99.07	94.36	94.63
France (franc)	54.40	52.52	52.50	141.43	136.54	136.48
Germany (mark)	16.03	15.55	15.57	41.66	40.42	40.47
Italy (lira)	11,891	11,480	11,451	30,914	29,845	29,770
Japan (yen)	1,272	1,239	1,400	3,307	3,222	3,641
Netherlands (guilder)	18.06	17.49	17.52	46.96	45.46	45.55
So. Africa (comm. rand)	25.92	25.36	24.54	67.37	65.92	63.79
So. Korea (won)	6,664	6,604	6,493	17,326	17,170	16,879
Spain (peseta)	992.23	957.29	965.65	2,580	2,489	2,510
Sweden (krona)	57.46	55.73	56.20	149.39	144.87	146.10
Switzerland (franc)	13.65	13.13	13.17	35.48	34.13	34.23
Taiwan (dollar)	247.48	244.79	253.45	643.39	636.39	658.92
UK (pound)	5.42	5.26	5.45	14.09	13.67	14.18
US (dollar)	9.20	9.10	9.25	23.92	23.66	24.05

Transaction Value[1]

Country (currency)	per lb equivalent U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)
Australia (dollar)	12.22	11.89	11.07	31.77	30.92	28.79
Belgium (franc)	333.21	326.09	295.95	866.28	847.75	769.40
Canada (dollar)	10.64	10.72	10.06	27.67	27.88	26.14
EC (ecu)	7.80	7.82	6.96	20.28	20.32	18.11
Finland (markka)	38.52	37.09	33.64	100.14	96.43	87.47
France (franc)	54.99	53.67	48.52	142.96	139.54	126.15
Germany (mark)	16.20	15.89	14.39	42.11	41.31	37.41
Italy (lira)	12,020	11,732	10,584	31,250	30,501	27,517
Japan (yen)	1,286	1,267	1,294	3,343	3,293	3,365
Netherlands (guilder)	18.26	17.87	16.20	47.47	46.46	42.11
So. Africa (comm. rand)	26.20	25.91	22.68	68.11	67.37	58.96
So. Korea (won)	6,737	6,749	6,001	17,514	17,547	15,602
Spain (peseta)	1,003	978.33	892.58	2,608	2,543	2,321
Sweden (krona)	58.09	56.95	51.94	151.02	148.06	135.04
Switzerland (franc)	13.80	13.42	12.17	35.87	34.88	31.64
Taiwan (dollar)	250.17	250.17	234.27	650.38	650.38	609.06
UK (pound)	5.48	5.37	5.04	14.24	13.97	13.11
US (dollar)	9.30	9.30	8.55	24.18	24.18	22.23

[1] As of May 1991 Report #273; calculated using currency exchange rates for the last business day of the month, as published in *The Wall Street Journal*. Prior to May 1991 Report #273; calculated using currency exchange rates published in *The Wall Street Journal* on the last business day of the month.

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MARKET REVIEW

MARKET VALUES EXPRESSED IN SELECTED CURRENCIES

Conversion Value[1]

Country (currency)	per lb U as UF_6			per kg U as UF_6		
	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)
Australia (dollar)	1.97	1.85	1.88	4.35	4.09	4.14
Belgium (franc)	53.74	50.84	50.19	118.49	112.09	110.65
Canada (dollar)	1.72	1.67	1.71	3.78	3.69	3.76
EC (ecu)	1.26	1.22	1.18	2.77	2.69	2.60
Finland (markka)	6.21	5.78	5.71	13.70	12.75	12.58
France (franc)	8.87	8.37	8.23	19.55	18.45	18.14
Germany (mark)	2.61	2.48	2.44	5.76	5.46	5.38
Italy (lira)	1,939	1,829	1,795	4,274	4,033	3,957
Japan (yen)	207.38	197.49	219.53	457.20	435.40	483.98
Netherlands (guilder)	2.95	2.79	2.75	6.49	6.14	6.06
So. Africa (comm. rand)	4.23	4.04	3.85	9.32	8.91	8.48
So. Korea (won)	1,087	1,052	1,018	2,395	2,320	2,244
Spain (peseta)	161.78	152.54	151.37	356.66	336.28	333.72
Sweden (krona)	9.37	8.88	8.81	20.66	19.58	19.42
Switzerland (franc)	2.23	2.09	2.06	4.91	4.61	4.55
Taiwan (dollar)	40.35	39.00	39.73	88.96	85.99	87.59
UK (pound)	0.88	0.84	0.85	1.95	1.85	1.88
US (dollar)	1.50	1.45	1.45	3.31	3.20	3.20

SWU Value And UF_6 Value[1]

Country (currency)	SWU Value at 0.30 % Tails Assay			UF_6 Value per kg U as UF_6		
	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)	This Month (May 31, 1991)	Last Month (Apr. 30, 1991)	12 Months Ago (May 31, 1990)
Australia (dollar)	70.96	66.50	64.75	36.27	34.85	33.02
Belgium (franc)	1,935	1,823	1,731	988.89	955.47	882.66
Canada (dollar)	61.81	59.96	58.80	31.59	31.42	29.99
EC (ecu)	45.28	43.71	40.73	23.15	22.91	20.77
Finland (markka)	223.49	207.40	196.75	114.32	108.69	100.34
France (franc)	319.30	300.11	283.77	163.20	157.27	144.72
Germany (mark)	94.06	88.84	84.15	48.08	46.56	42.91
Italy (lira)	69,794	65,599	61,897	35,673	34,376	31,567
Japan (yen)	7,466	7,083	7,570	3,816	3,712	3,861
Netherlands (guilder)	106.03	99.92	94.71	54.19	52.36	48.30
So. Africa (comm. rand)	152.11	144.89	132.63	77.75	75.93	67.64
So. Korea (won)	39,116	37,739	35,095	19,993	19,776	17,899
Spain (peseta)	5,824	5,470	5,220	2,977	2,867	2,662
Sweden (krona)	337.29	318.43	303.77	172.39	166.87	154.92
Switzerland (franc)	80.11	75.01	71.17	40.94	39.31	36.30
Taiwan (dollar)	1,453	1,399	1,370	742.43	733.02	698.71
UK (pound)	31.80	30.04	29.48	16.25	15.74	15.04
US (dollar)	54.00	52.00	50.00	27.60	27.25	25.50

[1] As of May 1991 Report #273: calculated using currency exchange rates for the last business day of the month, as published in *The Wall Street Journal*. Prior to May 1991 Report #273: calculated using currency exchange rates published in *The Wall Street Journal* on the last business day of the month.

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RECENT DEVELOPMENTS

On June 6, 1991, CONCORD/NUEXCO issued the following press release regarding a new joint venture with v/o Techsnabexport of the Soviet Union. The following is a reprint of that press release.

CONCORD, a group of companies owned by Oren L. Benton, a Denver-based businessman, and v/o Techsnabexport (TENEX) of the Soviet Union, have announced that they have formed a joint venture to market certain products and services of the Ministry of Atomic Energy and Industry (MAEI) of the Soviet Union, including all nuclear fuel products and services. The joint venture, to be called Global Nuclear Services and Supply, Ltd. (GNSS), will have offices in Moscow, Zurich, and Washington, DC later this year. GNSS will concentrate on securing long-term uranium and enrichment services supply contracts with utilities, principally in the United States and the Far East, although generally operating worldwide.

TENEX is a foreign trade association of the MAEI, the largest Ministry of the Soviet Union. TENEX has exclusive rights to market various products of the MAEI enterprises, including uranium and enrichment services. The enterprises have the capability to supply a significant percentage of the world's commercial nuclear power fuel requirements annually. TENEX is headquartered in Moscow and has been active in the supply of nuclear fuel on a worldwide basis for many years.

CONCORD has interests in mining, microchip development, banking and other industries including NUEXCO, the world's largest nuclear fuel trading organization. Recently, CONCORD announced formation of a joint venture with respect to the operations of Energy Fuels, a major US uranium producer based in Denver with mining and milling operations primarily in Arizona and Utah.

Speaking on behalf of GNSS, Mr. Benton and Mr. A. A. Shishkin, General Director of TENEX, said:

> GNSS's primary objective will be to provide the nuclear electric utility industry with a reliable, flexible, and economic long-term supply of nuclear fuel. Abundant uranium deposits, combined with advanced technology in uranium processing, put GNSS in a position to compete worldwide as a low-cost producer. With access to the broad market knowledge and marketing expertise of NUEXCO, we believe GNSS can achieve its objective of establishing itself as one of the world's most reliable and efficient nuclear fuel suppliers. Also, through this arrangement and other active joint ventures CONCORD has with the MAEI in marketing other MAEI enterprises' products, we anticipate that substantial investments will be made by TENEX and the MAEI in the purchase of industrial and consumer goods produced in the West consistent with the United States' stated intention to expand Soviet-US trade and investment.

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WASHINGTON FOCUS

by Linda L. Gunter

Congress continued its rapid pace on enactment of energy policy legislation; the House passed the Energy & Water Appropriations bill, while the Senate Energy & Natural Resources Committee concluded markup of National Energy Strategy legislation. In June, the Senate probably will bring to the floor for passage the Uranium Enrichment Act of 1991 (S 210). Additionally, the industry held a successful Nuclear Power Assembly, May 13-15. President Bush wrote to the assembly complementing the industry on its Strategic Plan for Building New Nuclear Plants. The President said, "Implementing the National Energy Strategy is essential, not only to our national security, but also to our economic productivity and competitiveness. This strategy calls for developing more economical, safer nuclear technologies."

Nuclear Power Assembly

◇ The 1991 Nuclear Power Assembly attracted the largest crowd ever, to hear an optimistic assessment of the industry's future. Debate on the National Energy Strategy has given the industry visibility, and the Clean Air Act's strict emission standards will make nuclear power an option for the future. There is consensus, both within Congress and the industry, that there are three issues to be resolved before nuclear energy will be considered a viable option for US electrical generation: reform of Nuclear Regulatory Commission (NRC) licensing procedures for reactors; standardized advanced designs certified by the NRC; and resolution of the spent fuel repository problem. The industry hopes public support for nuclear power generation will grow as the need for more electricity becomes apparent, and as global warming and clean air requirements restrict utilities' options for new power supply.

Sen. Malcolm Wallop (R-WY) presented the keynote address to the Assembly. He noted that the USA has become dependent upon foreign energy sources, as indicated by the fact that half of our trade deficit is caused by imports of energy. He also commented on the status of the omnibus energy bill (S 341) he and Sen. Johnston sponsored: the committee finished markup May 23 and he is relatively confident the bill will be passed by the Senate. The most controversial issue of the bill is Sen. Wallop's amendment on licensing reform, which codifies the NRC's intentions to hold one public hearing prior to construction. The amendment would allow a plant to operate once it is built, as long as no significant design changes or safety issues arise during construction.

The Assembly's first panel of speakers included representatives from private industry, as well as the US Department of Energy (DOE) and the Council on Environmental Quality (CEQ). The panel talked about how the passage of the Clean Air Act can be used to promote nuclear as a viable energy alternative. Lucinda Swartz of the CEQ called upon the industry to use the National Environmental Policy Act (NEPA) to involve the public in the debate about nuclear power. NEPA requires the development of an Environmental Impact Statement (EIS) on all major federal policy decisions. The completion of an EIS requires public hearings, thereby involving the public prior to construction, informing them about new nuclear plant designs, safety standards, and costs.

A second panel discussed obstacles to nuclear's renaissance. Rep. Jay Rhodes (R-AZ) noted that industry can expect the same problems with siting the civilian spent fuel repository at Yucca Mountain, as DOE is experiencing in getting the Waste Isolation Pilot Plant operating. Rep. Bob Clement (D-TN) spoke about his bill, HR 1184, concerning nuclear licensing reform and standardization of designs. Dr. Andrew Kadak, President and CEO of Yankee Atomic, concluded the panel with

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a discussion of license renewal. He noted that anti-nuclear groups have selected the license renewal issue as the next big issue in their drive to stop nuclear power. Kadak urged industry to make the point that extending the operating life of existing plants, through license renewal, is the least expensive, most efficient method to maintain needed power supplies. Industry must be successful on this issue or older plants will begin shutting down in nine years.

DOE Deputy Secretary, W. Henson Moore, gave the luncheon address. He hailed the Senate Energy & Natural Resources Committee vote on Sen. Malcolm Wallop's licensing reform amendment as a major victory for the industry, and said "the National Energy Strategy is incomplete without it." Moore emphasized that industry needs to continue to educate the entire Senate about the issue, and in particular, dispel the misconception that the amendment takes the public out of the process, when in fact, it ensures that everyone has an opportunity to participate in the licensing process, before a major investment is made in construction.

DOE FY 1992 Budget

◇ Congress made progress during May on DOE's FY 1992 budget request. The House Science, Space & Technology (SST) Committee marked up the authorizing bill for the Atomic Vapor Laser Isotope Separation (AVLIS) program and other nuclear research programs. On May 29, the House passed the Energy & Water Appropriations bill, cutting DOE's request for uranium enrichment by $209 million. The AVLIS program was cut by $50 million, and $159 million that DOE had set aside as working capital fund for the government corporation was removed. The appropriations committee report expressed concern about the Administration's decision to eliminate funding of predeployment activities for AVLIS, but to increase the R&D money. It stated, "In view of the reduced level of support for this process, there is no evident reason to expedite the research and development." The committee did not authorize DOE to purchase enrichment services, but instead deferred the decision until a government corporation is established.

Programs have funding levels set by authorizing committees, but the actual budget is determined by the appropriations committee. Congress has not passed authorization for DOE's AVLIS program since FY 1988, leaving the amount and allocation solely to the appropriations committees. This year, the authorizing committee (SST) increased the budget for AVLIS and required DOE to pursue predeployment activities such as selection of a Commercial Deployment Contractor. If the authorizing committee's legislation becomes law, some type of reconciliation will have to be worked out, because of conflict with the appropriations committee's actions reducing the budget for AVLIS.

Because of last year's budget agreement, funding for all FY 1992 programs is under close scrutiny, and with congressmen trying to find money for their own programs, DOE's AVLIS program could be harmed. Since the House has voted, the last chance for full funding of the AVLIS program will be the Senate appropriations bill, to be considered in June.

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INDUSTRY BRIEFS

TEPCO Reactor Plans Receive Approval

On May 15, 1991, Minister Nakao of the Ministry of International Trade and Industry, in conjunction with the Science and Technology Agency, approved construction permits for Tokyo Electric Power Company's (TEPCO) Kashiwazaki-Kariwa units 6 and 7. These are the final regulatory permits TEPCO needed before initiating construction of the two units. Construction of the sixth unit is scheduled to start later this year—the unit should reach commercial operation in mid-1996. Unit seven's construction should start in early 1992, and commercial operation should commence in mid-1997.

◆◆◆

India Selects Site For New 4,000 MWe Station

India's Atomic Energy Commission has selected Trikkareppur in the state of Kerala (on India's southwest coast) as the site for a proposed nuclear station. When completed, the station will include eight 500-MWe units, making it the largest station in the country. Initial power generation from the first phase of four 500-MWe units should occur in 1997.

This new station is one of the projects resulting from the nuclear cooperation agreement between India and the Soviet Union.

Spain's New Energy Plan To Continue Nuclear Moratorium

Spain's ruling Socialist party recently announced through Energy and Industry Minister, Claudio Aranzadi, that Spain's new National Energy Plan will not permit the operation of any new nuclear plants before the year 2000, and instead, will depend upon natural gas to meet the country's growing electricity demand. Nuclear proponents had hoped that the new energy plan would end the nuclear moratorium, first imposed in 1984. With this announcement, utilities are again considering cancellation of the incompleted reactors at Valdecabelleros and Lemoniz, rather than continuing their maintainence in a mothballed condition. Any governmental decision regarding the fate of the reactors has yet to be announced.

◆◆◆

Japan's 41st Reactor Begins Commercial Operation

On April 12, Tomari 2, a 550-MWe (net) PWR, began commercial operation. It is Hokkaido Electric Power Company's second nuclear reactor and is Japan's forty-first reactor to have reached commercial operation. Tomari 2 has been in pre-commercial testing since June 1990. The reactor's capacity raises Japan's total nuclear power capacity to 30,860 MWe (net).

General Atomics Agrees to Buy Chevron Uranium Properties

On June 4, General Atomics (GA) based in San Diego, California and Chevron Resources Company, a unit of Chevron Corporation of San Francisco, California, announced they had reached a definitive agreement whereby GA will purchase all of Chevron's uranium assets in the U.S.A and Canada. These assets include the Panna Maria uranium mill, a 55-percent share of the Rhode Ranch uranium mine in south Texas, the Mt. Taylor uranium mine in New Mexico (the largest uranium deposit in the USA), and exploration properties in Saskatchewan, Canada. Terms of the agreement were not released.

◆◆◆

Rio Algom Ltd. and Uranium Resources, Inc. Agree To Merge

In late May, Rio Algom, Ltd. (RAL) and Uranium Resources, Inc. (URI) agreed to a merger in which Rio Algom Mining Corporation (which is owned by RAL) will acquire all outstanding URI shares. Rio Algom presently owns eight percent of URI shares. Rio Algom likely will benefit from the acquisition of URI's current contracts and its technical expertise, particularly with respect to in-situ leach mining. The transaction probably will be concluded by the third quarter of 1991.

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URANIUM INDUSTRY OF THE PEOPLE'S REPUBLIC OF CHINA

China has a well-developed uranium industry capable of supporting the nation's ambitious domestic nuclear program. China's geology is diverse and offers a good potential for uranium deposits. A large number of deposits have been found to date; most are small and of low to moderate grade, but the combined production capability is substantial. China is the world's third largest country, with an area of approximately 9.6 million square kilometers (3.7 million square miles), which is almost as large as Canada, and slightly larger than the USA.

Currently, China has several nuclear power plants under construction and an aggressive plan for building future reactors, but no reactors have yet reached commercial operation. For this reason, China can make available for export to the world market about three million pounds equivalent U_3O_8 annually.

Background

The government-owned China National Nuclear Corporation (CNNC), which reports to the Council of State, is responsible for all aspects of the nuclear industry in China. CNNC was founded on September 16, 1988 and is the successor to the Ministry of Nuclear Industry.

CNNC incorporates over 200 enterprises, companies, and institutions employing a total of about 300 thousand people, 70 thousand of whom are scientists and engineers. CNNC constructs and operates nuclear power plants, maintains research facilities, and designs and produces instruments and machinery not only for the nuclear industry, but also for electrical and metallurgical enterprises. A special branch is dedicated to safety, and environmental and health protection. China Nuclear Energy Industry Corporation (CNEIC), the firm responsible for the marketing and export of Chinese uranium around the world, is a branch of CNNC.

Two branches of CNNC, the Bureau of Uranium Mining and Metallurgy (BMM) and the Bureau of Geology (BG), control uranium exploration and mining. The principal duty of BG is the discovery of uranium resources that are sufficient to fuel China's present and future nuclear power plants. BG and its predecessors started exploration for uranium in 1955, initially with assistance and supervision of Soviet experts. More than 200 deposits and major occurrences of uranium have been discovered.

Since 1979, BG also has explored for rare earth elements, precious metals, and potassium deposits. In addition to exploration, BG offers consulting and contract services for ore reserve calculations, engineering geology, environmental geology, and exploration for oil and other commodities (**Table 1**). The bureau employs more than 60 thousand people who are directed from six regional offices:

- Changsha, Hunan province.
- Guangyuan, Sichuan province.
- Nanchang, Jiangxi province.
- Shaoguan, Guangdong province.
- Shenyang, Liaoning province.
- Xi'an, Shaanxi province.

Table 1
Other Facilities Controlled by CNNC's Bureau of Geology

- Beijing Research Institute for Uranium Geology
- East China Geological College in Fuzhou, Jiangxi
- Geological Secondary School and Technical Secondary School (training centers)
- Center for Airborne Surveys and Remote Sensing
- A production plant for survey instruments
- A production plant for synthetic diamonds

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Uranium Provinces and Regions

China has several key uranium regions which are located throughout the country (**Figure 1**). In order of importance to current uranium production, these production centers include:

1. Southeast China uranium region (Zhejiang, Jiangxi, Hunan, Guangdong, and Guangxi provinces).
2. Jingnan uranium region in southern China (Guangxi province).
3. Yin Shan–Liaohe uranium region in NE China (Liaoning and northern Hebei provinces).
4. Qilian–Qinling uranium region in central China (Gansu, Shaanxi, Henan, and Hubei provinces).
5. Zhungel–Tian Shan uranium region in NW China (in the Junggar Basin of Xinjiang province).
6. West Yunnan uranium region in SW China (Yunnan province).
7. Southwest Guizhou uranium region (Guizhou province).

The Southeast China uranium region is the most important uranium region presently, but more recent discoveries in the Yin Shan, Qilian, and Zhungel uranium regions may increase the significance of these production centers in the future.

Types of Uranium Deposits

The four prevailing types of uranium deposits in China containing economically viable uranium resources are:

- Granite-related deposits.
- Volcanic-related deposits.
- Sandstone-type deposits.
- Strata-structure-type deposits.

Other types of deposits of economic interest include metasomatic, intrusive (alkaline syenite, pegmatitic granite), silicic breccia, lignite, phosphorite, and carbonate-hosted mineralization. Strata-structure types of uranium deposits are defined as stratabound, structure-controlled uranium mineralization, which is primarily of a disseminated replacement nature. This mineralization is confined to altered fracture zones in distinct sedimentary or slightly metamorphosed sedimentary lithologies composed of primarily siliceous carbonate or pelite-dominated facies enriched in carbonaceous matter. Deposits of this type are termed by Chinese geoscientists as carbonate-siliceous-pelite type deposits.

Legend to Figure 1

Uranium Regions

- Z-TS — Zhungel–Tian Shan uranium region
- YS-L — Yin Shan–Liaohe uranium region
- Q-Q — Qilian–Qinling uranium region
- WY — West Yunnan uranium region
- J — Jingnan uranium region
- SG — Southwest Guizhou uranium region
- SC — Southeast China uranium region (see detail in figure 2)

Uranium Mills

- A — Hengyang
- B — Zhuzhou
- C — Shao Kuan
- D — Hengjian
- E — Guizhou
- F — Huxian
- G — Lianshanguan
- H — Ürümqi

Uranium Deposits

- ● — designates granite-related deposit
- ▲ — designates volcanic deposit
- ◆ — designates sandstone deposit
- ✖ — designates strata-structure deposit
- ◗ — designates metasomatite deposit
- ■ — designates intrusive-type deposit

- ▲ 1 — Balyanghe deposit
- ◆ 2 — Mengqiguer deposit
- ◆ 3 — Daladi deposit
- ◆ 4 — Kashi Depression
- ◗ 5 — Lianshanguan area
- ■ 6 — Saima deposit
- ◆ 7 — Jianchang area
- ▲ 8 — Qinlong–Daxing'anling volcanic belt
- ◆ 9 — Langshan deposit
- ■ 10 — East & West Longshoushan belts
- ◗ 11 — North Qinlian belt
- ✖ 12 — So. Qinling area (Norgai deposit)
- ● 13 — Xi'an area
- ■ 14 — Danfeng-Zhuyangguan-Shangnan area
- ◆ 15 — Wudang–Huaiyong Massif
- ◆ 16 — So. Lancang (Mekong) River area
- ◆ 17 — Gaoligong area
- ◆ 18 — Tunling deposit
- ✖ 19 — Chienxinan deposit

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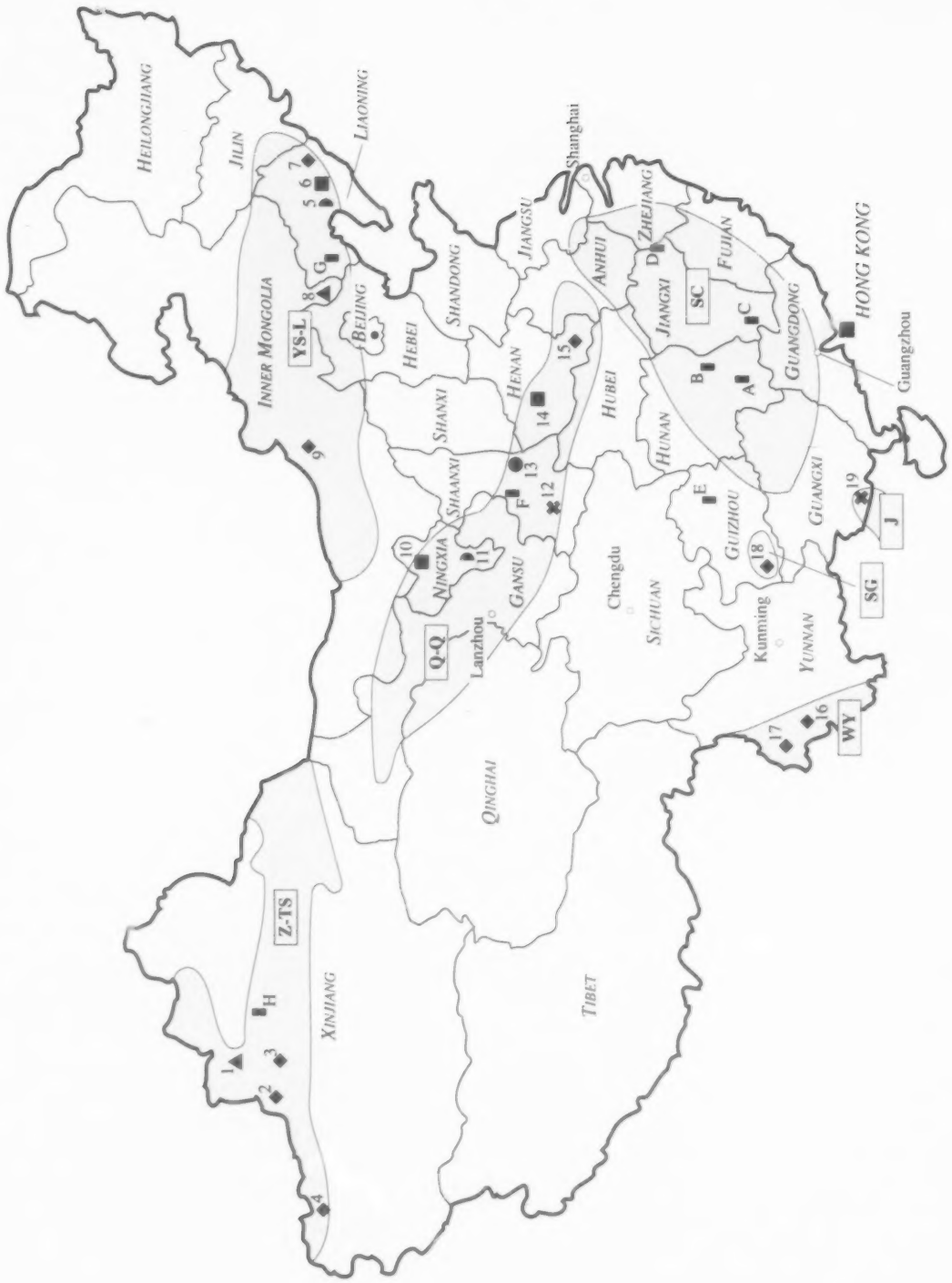

Figure 1
URANIUM REGIONS, DEPOSITS, AND MILLS OF CHINA

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Granite-related deposits (intragranitic and perigranitic veins) are particularly abundant in the central (Nanling) metallogenetic zone of the Southeast China uranium region. Some minor deposits or occurrences also have been identified in the Xi'an area of Shaanxi province, the North Qinling fold belt in central China, and the Lower Yangzi granite belt in the Jiangsu province in the southeast.

Volcanic-related deposits (vein and stratiform) are prominent in the eastern (Zhejiang-Fujian) metallogenetic zone in Southeast China, particularly in the Gan-Hang volcanic belt, and less prominently in the south Jiangxi-north Guangdong volcanic-granite belt. Other locations with volcanic deposits include the Zhungel-Tian Shan region, and the Daxing'anling-Yanshan volcanic belt of the Qinglong region in Northeast China.

Sandstone-type deposits are reported from the Illi Basin and Kashi Depression in Northwest China; the Jianchang, Qinglong and Langshan areas in Northeast China; the North Qilian fold belt and Wudang-Huaiyang Medium Massif/North Qinling fold belt in central China; Baoshan Medium Massif in western Yunnan province; Jingnan Block in southern China; and Pukuitang in Southeast China.

Strata-structure types of deposits are distributed in the western (Guangxi, Hunan, Jiuling, Jiangxi and Xuefeng) metallogenetic zone of Southeast China, the Southwest Guizhou region, the Zhungel-Tian Shan uranium region, and the Beilungjiang anticlinorium/south Qinling fold belt of central China.

Metasomatic-type deposits have been identified from Lianshanguan/Liaodong Block and the North Hebei region of Northeast China. Intrusive-type mineralization (Saima nepheline syenite complex) also occurs at the Liaodong Block. Other locations with metasomatic uranium mineralization include the eastern Longshoushan and North Qilian fold belts in central China.

Uranium Resources

China's reasonably assured resources, plus estimated additional resources, exceed 140 million pounds equivalent U_3O_8, which is distributed among five primary districts/deposits (**Table 2**). Individual deposits of all types are generally of low grade (about 0.05 to 0.25 % U) and small tonnage. However, some districts contain several million pounds of reserves, with one district reaching 67 million pounds equivalent U_3O_8. More than 10 million pounds of the Chengxiang deposit's nearly 16 million pounds equivalent U_3O_8 have been mined. In Northeast China, the Langshoushan deposits were mined for several years; the Chinese government reported that the deposits contained over 250 million pounds of reserves.

NUEXCO estimates China is currently operating at 50 percent of its uranium production capability, which is believed to be in the range of 10 million pounds U_3O_8 per year. This production is thought to be reasonably competitive, with an associated cost of less than $20 per pound U_3O_8.

Uranium resource distribution by type of deposit shows that the bulk of resources in China are contained within four types of deposits:

Deposit Type	Share of total U resources
Granite-related deposits	41%
Volcanic-related deposits	20%
Sandstone type deposits	21%
Strata-structure type deposits	13%
Other [1]	5%

[1] Other: metasomatite, intrusive (alkaline syenite, pegmatitic granite), silicic breccia, lignite, phosphorite, and carbonate-hosted mineralization.

Table 2
China's Primary Uranium Districts

District	Resources (million lbs U_3O_8)	Deposit Type
Xiazhuang district, Guangdong province	31.2	granitic
Xiangshan district, Jiangxi province	67.6	volcanic
Qinglong district, Hebei province	20.8	sandstone-volcanic
Chanziping deposit, Guangxi province	13.0	strata-structure
Chengxiang deposit, Hunan province	15.6	strata-structure

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Figure 2
URANIUM MILLS AND DEPOSIT TYPES IN SOUTHEAST CHINA

Legend

- Uranium belt or region—predominantly granite-related deposits
- Uranium belt or region—predominantly volcanite-related deposits
- Uranium belt or region—predominantly strata-structure type deposits
- Uranium belt or region—predominantly sandstone-related deposits
- Boundaries of uranium-metallogenetic-tectonic domains

1. Hengyang Mill
2. Hengjian Mill
3. Zhuzhou Mill
4. Shao Kuan Mill
5. Guizhou Mill

1. Nanling Uranium Belt
2. Central-Southern Jiangxi Uranium Belt
3. Lower Yangzi Uranium Belt
4. Gan-Hang Uranium Belt
5. S. Jiangxi–N. Guangdong Uranium Belt
6. Xuefong–Jiuling Uranium Region
7. North Side Jiangnan Block Uranium Region
8. South Side Jiangnan Block Uranium Region
9. Guangxi–Hunan–N. Guangdong U Region
10. Southwest Guizhou Uranium Region
11. Jingan Basin Uranium Region

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Ore Processing

China may have nine or more uranium beneficiation plants; their locations are given in **Table 3**. The last three plants listed in the table—Ürümqi in Xinjiang province, and unknown locations in Guangdong and Yunnan provinces—cannot be confirmed and may be only in the planning stages. The two primary mills, at Hengyang and Hengjian, are listed first, along with their estimated annual capacities.

Table 3
China's Uranium Processing Plants

- Hengyang, Hunan province – 3.1 million pounds U_3O_8 per year
- Hengjian, Jiangxi province – 1.7 million pounds U_3O_8 per year
- Zhuzhou, Hunan province
- Shao Kuan, Jiangxi province
- Huxian, Shaanxi province
- Lianshanguan, Liaoning province
- Ürümqi, Xinjiang province
- Guangdong province
- Yunnan province

Hengyang Metallurgical Plant, Hunan province

The mill at Hengyang (**Figure 3**) serves as the central metallurgical plant for uranium deposits in Hunan and adjacent provinces. The plant opened in 1962 and employs more than 4,000 people. It has a treatment capacity of up to one million metric tons of ore per year, which yields a production capacity of approximately 2.6 million to 3.1 million pounds equivalent U_3O_8 per year.

Ore delivered to the mill is stockpiled separately according to the origin of the deposit. The ore is crushed first by jaw crushers to less than 150 millimeters, and subsequently, by cone crushers to less than 40 mm. Wet grinding in ball mills reduces the particle size to less than 0.8 mm. The ore pulp contains 55 percent solids. Ore containing a high clay fraction is crushed and ground separately. Next, the ore pulp is separated in cyclones into solid and liquid components. The fractions are then treated separately.

Figure 3 — Hengyang uranium mill in central Hunan province.

Leaching takes place in Pachuca tanks by adding sulfuric acid at temperatures of about 75°C, and if necessary, oxidants. Sandstone-type ore is leached at lower temperatures than other types of ore, such as volcanic or granitic. Leaching time for the sandstone ore is low at 5 to 6 hours. Ore containing high percentages of organic carbon requires elevated acid amounts, up to 70 kg per metric ton ore. The solid particle fraction is treated in three stages and then deposited in tailings ponds.

After neutralization, the uraniferous solution is passed through ion exchange columns, where uranium is extracted from the ion-exchange resins with nitric acid. Uranium content in the strip-solution is

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approximately 10 grams per liter. The addition of ammonium hydroxide results in the precipitation of ammonium diuranate. After drying, this precipitate is calcined to U_3O_8 and then stored in barrels.

A pilot plant, with a capacity of about 25 metric tons ore per day, serves for ore testing by acid, alkaline, and high pressure-high temperature leaching.

Hengjian Mill, Jiangxi province

The Hengjian mill serves the Gan-Hang uranium district with an annual capacity of approximately 1.7 million pounds equivalent U_3O_8. Acid leaching of ore (usually volcanic type) produces a concentrate of about 43-percent uranium, with a recovery rate of 93 to 95 percent. The concentrates are hauled to the central metallurgical plant in Hengyang for refining. About 500 people work in the Hengjian mill, in three shifts per day, six days a week.

Conclusion

To meet the anticipated needs for its very ambitious nuclear program, China continues to explore for and develop uranium deposits throughout the country. While mostly lower-grade deposits have been located thus far, the geology of the country suggests that China has uranium resources far exceeding its domestic requirements, and will therefore remain active in the world export market.

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SPEECH

SOVIET UNION'S URANIUM TRADE POLICY

The following article is an edited version of a speech presented on May 14, 1991 by NUEXCO Senior Vice-President James E. Vaughan at the World Nuclear Fuel Market Conference held in Atlanta, Georgia.

The World Nuclear Fuel Market (WNFM) first approached me to arrange for a speaker from Techsnabexport, but because of the short notice and schedule conflicts, that was not possible. So the WNFM asked me to speak instead. When I protested that I really could not add much to what had already been published, they said "come anyway, for your symbolic value."

On the theme of symbols, the symbol of the Soviet Union in the uranium market today must be the so-called Soviet uranium stockpile. In fact, it often seems that virtually no discussion about uranium can proceed without some mention of this allegedly huge stockpile. "Will the Soviets flood the market with this material?" is a typical question. Furthermore, according to what one hears, the stockpile seems to grow bigger every day. One almost expects the next question to be, "Do you suppose the gravitational force of this huge mass of uranium can affect the tides?" I sarcastically ask, "What if the stockpile is even bigger than that?" Perhaps, due to the effects of gravity, the stockpile might collapse under its own weight to form a neutron star. The stockpile already appears to obey the laws of quantum physics, as would a neutron star. For example, it appears to obey the *Heisenberg Uncertainty Principle* that holds that there is a limit to accuracy by which one can measure anything.

With regard to the size of the Soviet stockpile, the uncertainty is enormous. Data directly from the Soviet Union is both limited and contradictory. The Uranium Institute recently estimated the size of the stockpile at 500 million pounds equivalent U_3O_8. This estimate was based on the difference between two figures: the first was cumulative uranium production in the USSR and Eastern Europe from 1945 until today; the second figure was cumulative civilian and military use of uranium in those same regions for the same period. Some of the data used in that estimate was extremely accurate: for example, production in Czechoslovakia and the former East Germany. On the other hand, any estimate of cumulative production in the USSR is highly speculative.

Even more speculative is the estimate of military uranium utilization. For example, the Uranium Institute's estimates of military use were based on an assumed number of warheads, and an assumed amount of uranium required to produce them—the latter based on Western experience. But new and often surprising revelations continue to emerge regarding the Soviet economy and military. Only a year or so ago we were all surprised when the Soviets announced they had been using centrifuge enrichment since 1952, not gaseous diffusion as we had all assumed. Also, based upon revelations of Soviet economists, it seems that the CIA consistently and substantially overestimated the size of the Soviet economy. Thus, any estimate of Soviet military data must be viewed as very uncertain. This is not to belittle the efforts of the Uranium Institute. I was part of the working committee that produced the estimate. These points just underscore the highly uncertain nature of any estimate of the size of the Soviet stockpile.

These points just underscore the highly uncertain nature of any estimates of the size of the Soviet stockpile.

Getting back to quantum physics, the Soviet stockpile also could be said to obey the *Pauli Exclusion Principle*. This Principle states that no two particles can occupy the same energy level. By analogy, I would postulate the Vaughan Exclusion Principle: no unit of uranium in the Soviet Union can be part of both the civilian and military inventory. The military in the Soviet Union remains very influential, as recent events bear out. I propose that uranium already transferred to the military would not be available to the civilian sector to sell to the Western market. It is excluded.

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Having established a Soviet civilian stockpile of very uncertain size, we can then ask what the likelihood is that some of this stockpile will make its way to the West. In other words, what is the probability of the *Tunnel Effect*?

I can confirm that this tunnel effect probability is greater than zero, since it has already happened. NUEXCO has moved about 100 metric tons of Soviet enriched uranium to the USA. The main purpose of this stockpile in the West is to offer security of supply to potential customers. It is our plan to increase this stockpile substantially to guarantee smooth deliveries under long-term contracts. Thus, Soviet inventory will continue to reach the West to help continue ongoing operations, or in other words, to demonstrate *Conservation of Momentum*.

The Soviet Ministry of Atomic Energy and Industry operates uranium mines (the majority of which are co-product mines), as well as enrichment plants. Information on uranium conversion and enrichment in the Soviet Union was published in the April 1991 NUEXCO Monthly Report (#272, p. 27-35).

The major drag on the market remains what it has been for some time—not a stockpile in the East, but the stockpile in the West.

The Ministry plans to keep these operations producing in order to keep the work force employed. They hope to accomplish this, in part, through exports. Such an objective is incompatible with the liquidation of a huge stockpile.

Having said all this about the Soviet stockpile, let me turn for a minute to discuss the extent to which Soviet uranium sales have penetrated the market. Recently, NUEXCO estimated the sources of the approximately 35 million pounds equivalent U_3O_8 that will be used in the European Community this year. Of the many sources, the major source is the drawdown and redistribution of European Community inventories. On the second plateau are imports from Niger and production in France. On the next level, are imports from Canada and the Soviet Union. The next most important sources are recycled uranium and plutonium, and imports from Gabon and Australia. So as you can see, the major drag on the market remains what it has been for some time—not a stockpile in the East, but the stockpile in the West.

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SPEECH

THE MARKETS FOR URANIUM AND ENRICHMENT

An Overview of Current Status & Future Directions

The following is an edited version of the speech presented by George White Jr., Senior Vice President of NUEXCO, at the General Electric Company's Executive Fuel Conference, on May 20, 1991 at Hilton Head Island, South Carolina.

Introduction

My assigned mission today is to provide some perspective on the current status and the likely future direction of the markets for uranium and enrichment services. Uranium and enrichment are to nuclear reactors what crude oil and refining are to automobiles. And, concerns about uranium and enrichment will, or should, be similar to the motorist's concerns about gasoline. Is there enough of it? How much does it cost?

URANIUM

Let us look at uranium first. The big picture is easily described.

- Is there enough uranium to go around? The answer is an unequivocal and resounding "Yes."
- Will it always be possible to buy uranium at the current spot price level of some $9.00 per pound U_3O_8? The answer is an equally unequivocal "No."
- Given then, that the price of uranium must eventually rise, will it, nevertheless, always be possible to buy uranium at prices that will continue to assure nuclear's competitive advantage? Another resounding "Yes."

Let me provide a bit more detail. Already identified, reasonably assured resources are sufficient to support any realistically imaginable level of nuclear power development well into the 21st century. Furthermore, and the record is very clear on this point, as we have continued to explore for uranium, we have continued to find more of it. Of particular consequence, the more recent discoveries have been larger and richer, by an order of magnitude, than those that launched the nuclear era some 40 years ago. Suffice it to say that the resources are vast.

Unfortunately, the best uranium resources are not found in those countries that have the largest nuclear power programs. Thus, the largest and/or richest uranium provinces are found in Australia, western Canada, central Africa, and Namibia rather than in the United States, western Europe or Japan. While extensive, US resources are relatively lower grade, higher cost, and the uranium produced from them is, consequently, relatively more expensive.

In my view, therefore, it is extremely difficult to make a compelling case for any limitations on the import of foreign-origin nuclear fuel. I submit that a more persuasive argument can be made for exploiting the lower-cost, lower-priced uranium available from resource rich countries, and saving US uranium for the proverbial rainy day. US dependence on imported uranium has been likened by some, however inappropriately, to US dependency on imported oil. It would be my view that expressions of concern that the security of US uranium supply is jeopardized by the level of imports simply fail the test of reason. Uranium inventories in government and private hands are equivalent to several years' forward usage; further, import sources are geographically diverse, making it most unlikely that all could fail simultaneously; finally, as noted above, the US has its own, albeit more costly, sources of supply. In view of the above, I would suggest the security of supply issue is really moot.

Given that there is plenty of it, the only other major concern about uranium is its price. At $9.00 per pound U_3O_8, the current uranium spot price is at an all-time low. **Figure 1** depicts the history of the NUEXCO Exchange Value. I should note that the Exchange Value has for years been viewed as a surrogate or proxy for the spot price of uranium. As can be seen, prices have cycled in rather

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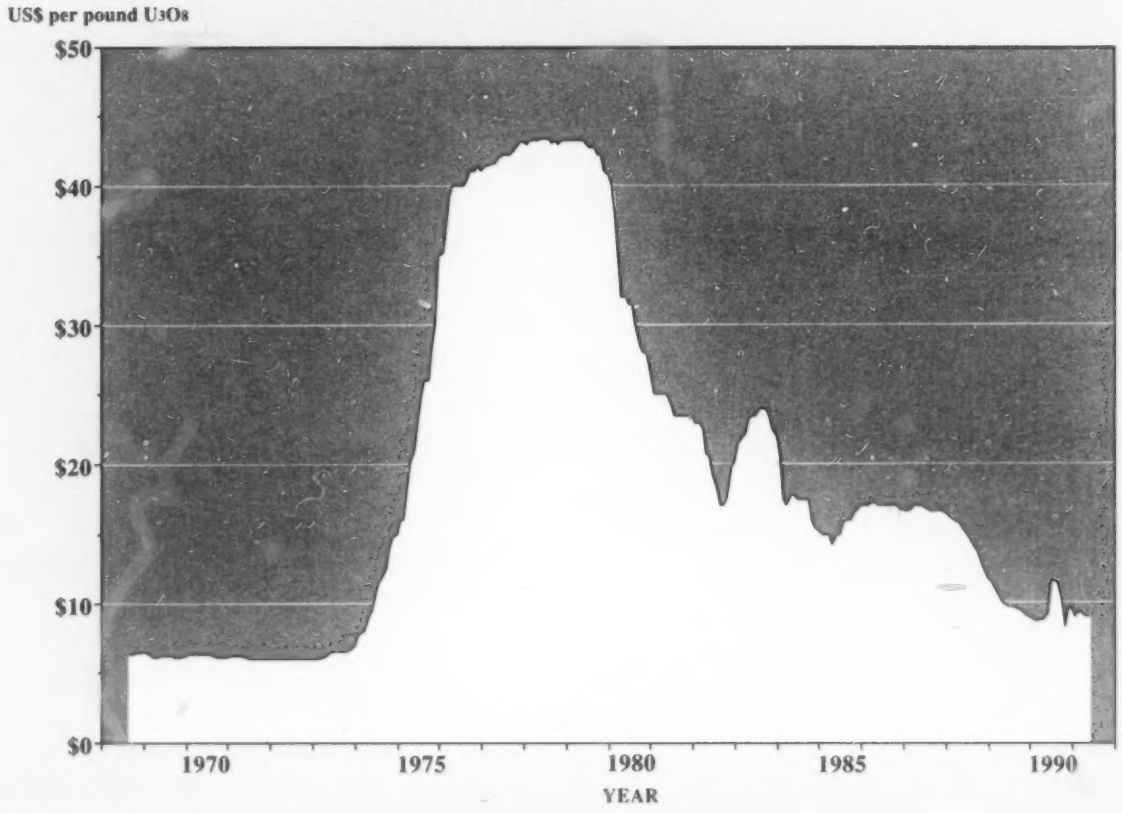
Figure 1
HISTORICAL NUEXCO EXCHANGE VALUES



dramatic fashion—from $6.00, to $43.00, and now back to $9.00. Even more instructive, perhaps, is **Figure 2** that reflects these same prices adjusted for inflation.

Since a 1,100 MWe boiling water reactor consumes about 500,000 pounds of U_3O_8 per year, we are looking at annual uranium expenditures, based on current price levels, of only some $4.5 million per reactor per year. Back in 1977, that same 500,000 pounds would have cost more than $21 million. Adjusted for inflation, that 1977 cost would have been greater than $39 million. While such costs may pale in comparison to overall utility expenses, or even to overall nuclear operation and maintenance expenses, the difference between $4.5 million and $21 million is substantial.

And, why are uranium prices at such low levels? The simple answer is that supply exceeds demand. However, this doesn't really adequately explain the situation, for with actual consumption substantially higher than production, one would expect strong and rising prices. Indeed, 1990 Western World production of 75 million pounds U_3O_8 fell some 45 million pounds short of matching 1990s consumption of 120 million pounds. The 1991 shortfall is forecast to be even larger, at 58 million pounds, as consumption increases to 125 million and production declines further to 67 million pounds. The missing link is, of course, inventory. At the beginning of 1991, excess Western World uranium inventories were estimated at 160 million pounds U_3O_8. In this context, "excess inventory" is defined as inventory that is in excess of identified "normal" or "desired" levels and is, therefore, available for sale or loan.

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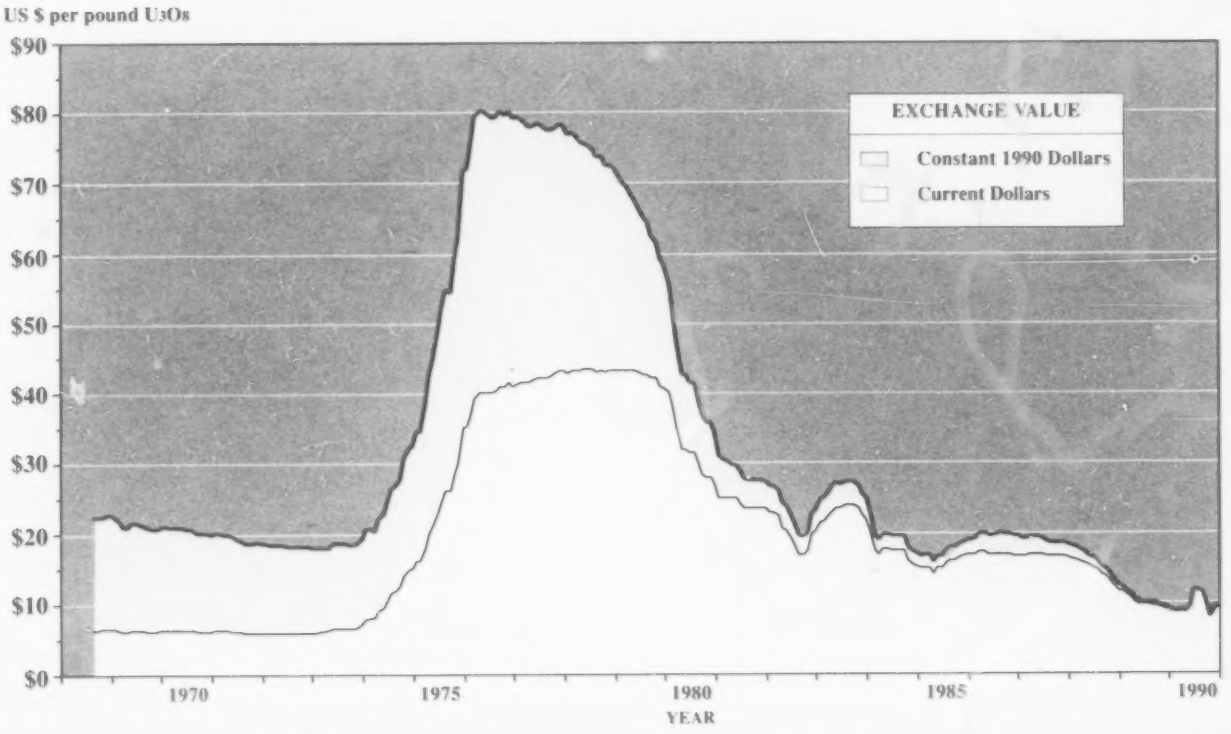
Figure 2
HISTORICAL, INFLATION-ADJUSTED NUEXCO EXCHANGE VALUES



In addition, as a consequence of political changes during the past two years, and the development of a world market in nuclear fuel, large new uranium sources have become available from China, eastern Europe, and the Soviet Union. These sources share some or all of the following characteristics:

- A uranium supply capability well in excess of civilian needs.
- The reduction or elimination of military requirements for uranium.
- The existence of substantial excess uranium inventories.
- A pressing need for foreign exchange.

The Soviets and the Chinese, in particular, have indicated that they intend to become world-class uranium suppliers. The availability for sale from these sources of both production and, more particularly, large inventories will almost certainly delay, by several years, any meaningful or lasting price recovery.

Though large inventories over-hang the uranium market, economics have, at last, begun the process of forcing the uranium supply/demand equation into balance. In time, as these excess inventories are absorbed, production must increase to the level of consumption. And such increased production means new mines and mills. But, the financing of such new facilities requires uranium prices that can guarantee a return on investment. While I cannot forecast with any confidence or accuracy the exact price level required to motivate production of the 173 million pounds of uranium needed to meet worldwide utility requirements in the year 2000, I can absolutely assure you that it is more than $9.00 per pound U_3O_8; and, with almost equal assurance, I can state that it is unlikely ever again to approach $30.00 per pound. Regardless of the specific level, uranium prices will never be the deciding factor in the economics of nuclear power.

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ENRICHMENT SERVICES (SWU)

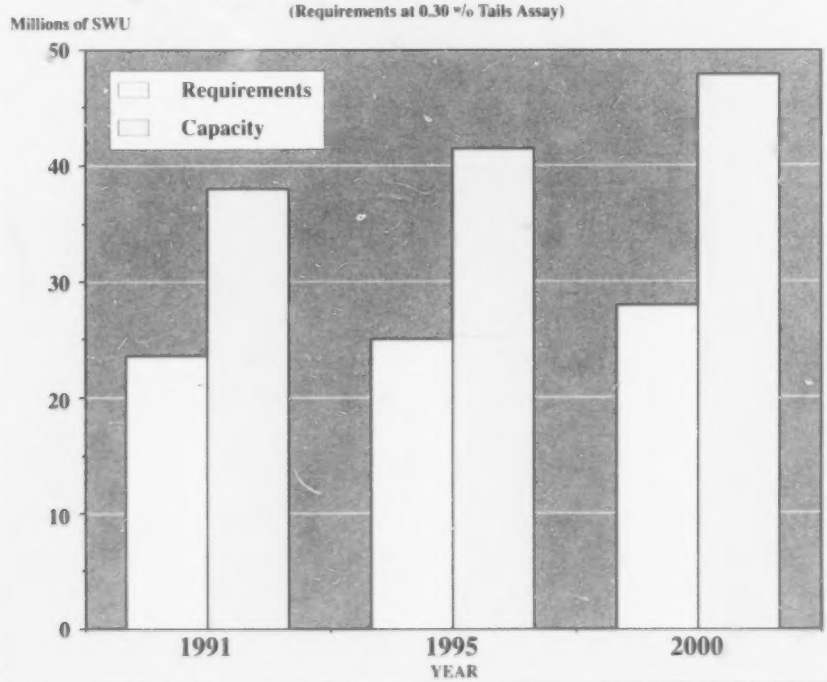
Turning now to enrichment, we are dealing with a market that is both different and manifestly more complex than uranium. **Figure 3** provides a snapshot of the current enrichment market, comparing worldwide SWU production capacity and SWU requirements through the year 2000. The extent of overcapacity is evident. **Figure 4** provides a breakdown of the individual suppliers. They include:

- **DOE**, which operates two gaseous diffusion plants (at Paducah, Kentucky and Portsmouth, Ohio) with total annual capacity of over 19 million SWU, representing about 50 percent of world capacity. Note that this figure does not even include DOE's eight million SWU-per-year Oak Ridge, Tennessee plant, which was placed on standby in 1985.
- **Eurodif**, whose marketing is controlled by Cogema, France's national fuel cycle organization, can produce 10.8 million SWU annually at its gaseous diffusion plant located at Pierrelatte, France.
- **URENCO**, a tri-national European consortium, operates centrifuge plants in the UK, the Netherlands, and Germany, with a total annual capacity of some three million SWU.
- **The Soviet Union**, utilizing centrifuges to produce essentially all of its SWU, currently has the capability to export 3 million SWU annually, and has announced that figure could grow to 10 million SWU annually by the mid-1990s. Such data indicate that overall Soviet production capability is well in excess of 10 million SWU annually.
- **China**, using gaseous diffusion technology, has a small, but as yet unutilized, export capability.
- **Japan**, with a pilot centrifuge plant, produces much smaller and, to date, non-commercial quantities of SWU.

In addition, there are two other potential SWU suppliers on the horizon:

- **Louisiana Energy Services**, known as LES, is a joint venture involving Duke Power Company, Northern States Power, and Louisiana Power & Light, with URENCO providing the centrifuges and Fluor-Daniel providing engineering and construction services. By 1996, LES hopes to have an $850 million centrifuge plant, capable of producing 1.5 million SWU annually, in operation in Louisiana. To that end, it is currently engaged in an aggressive marketing campaign to base load the facility.
- **CRISLA Technologies**, promising chemical-laser technology developed in the US private sector, has moved to Canada for funding. CRISLA is also busy marketing and, if the technology proves out, hopes to have a small plant in operation by the mid-1990s.

Figure 3
PROJECTED ANNUAL WORLD ENRICHMENT REQUIREMENTS AND CAPACITY FOR WESTERN WORLD
(Requirements at 0.30 w/o Tails Assay)



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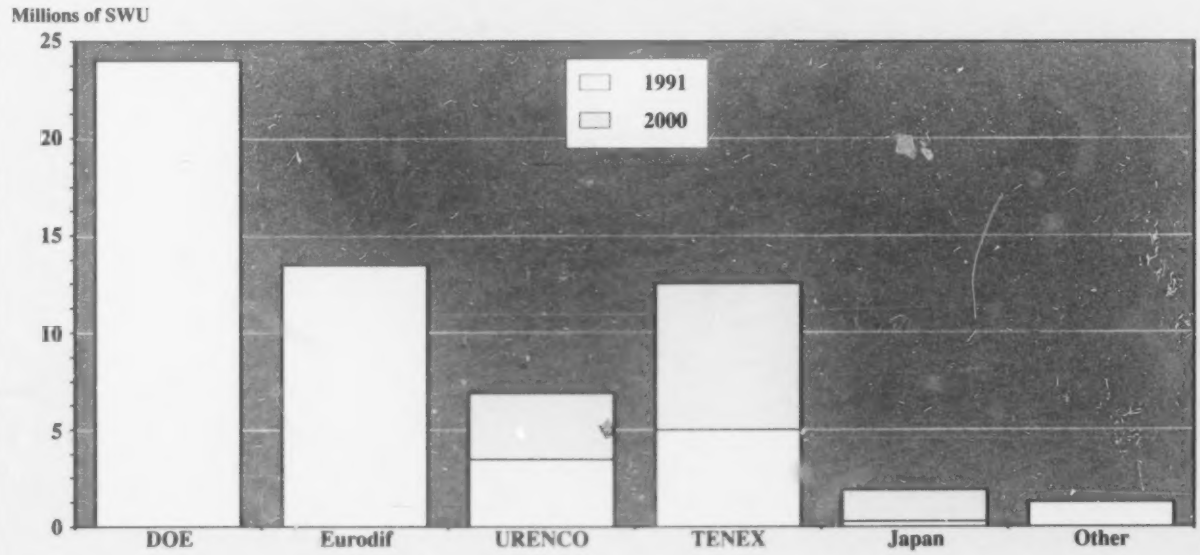
Though steadily losing market share during recent years, DOE remains the largest single factor in the enrichment industry, and the key to understanding the market. In 1970, DOE's control of the world enrichment market was essentially complete—effectively a total monopoly. However, as nuclear programs grew, DOE's ability to supply SWU was increasingly stretched. For European utilities particularly, a combination of security of supply and nationalistic concerns provided irresistible arguments for locating new enrichment capacity in Europe. DOE's closing of its order books in late 1972 led to the first terminations, as the European SWU buyers underwrote and committed to purchase from Eurodif and URENCO. DOE lost additional market share in the early-1980s as excess SWU inventories led to market imbalances and the development of an active and aggressively priced spot market.

Given this existing and potential new capacity, one wonders if there any reason to worry about enrichment. The answer, unfortunately, is "Yes." Unlike the uranium market, the SWU market has, to date, shown little evidence of commercial rationality. Political considerations, including well-intentioned non-proliferation concerns, control. These, in turn, have led to some unusual situations.

- More than two-thirds of world enrichment capacity is now represented by plants which utilize the power-intensive and expensive 40-year old gaseous diffusion technology, and the majority of that capacity is US-based and not built to current regulatory standards.
- A 3.6 billion dollar US investment in centrifuge technology was totally written off and the hardware destroyed in favor of a yet-to-be-demonstrated, laser technology known as AVLIS (Atomic Vapor Laser Isotope Separation), which DOE now appears to be allowing to wither on the vine.
- As noted earlier, a consortium involving three US utilities has moved to exploit centrifuge technology in the US.
- It has recently become known that the Soviet Union, using centrifuge technology, development of which began in the 1950s, may well be the world's lowest-cost SWU producer.

Accordingly, and to the extent that utility managers have time to devote to the front end of the fuel cycle, I would strongly suggest that they focus on enrichment, for it is this area that has the greatest potential for unexpected and costly events. Mere understanding of the

Figure 4
ESTIMATED URANIUM ENRICHMENT CAPACITY AVAILABLE BY SUPPLIER FOR WESTERN WORLD



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situation may not forestall such events from occurring, but such understanding, combined with advance planning and a pro-active posture, can reduce or eliminate the possibility of expensive and embarrassing surprises.

From literally "owning" the entire SWU market in 1970, DOE's share has eroded to the point that, based on recent customer notices, of an estimated US demand of some 10 million SWU in the year 2000, only ten percent is currently committed to DOE. What happened? As noted above, security of supply and nationalism were certainly the prime movers in launching Eurodif and URENCO, but thereafter, it has been simply a matter of price and DOE's inability to respond rapidly and effectively in a changing marketplace.

It is not overstating the case to note that DOE's enrichment business is in crisis. In my view, that crisis will, in turn, impact nuclear utilities in general and US nuclear utilities in particular. DOE's overriding problem has been, and remains money or, more accurately, the lack thereof. Simply put, despite a legal mandate to recover all of its costs, DOE has not done so. Concerned that raising its prices would lead to customer defections, DOE, despite being the highest-cost SWU producer, attempted to compete on price. DOE lost on both counts: its cash flow was penalized *and* its customers terminated. Thus, DOE is now selling fewer SWU at lower prices.

At the same time, DOE faces billions, perhaps tens of billions, of dollars of unfunded decommissioning and decontamination costs. Additional, unplanned costs will be incurred to mitigate recently identified PCB problems and for the ultimate disposal of some 45 years worth of uranium tails generated by the diffusion plants. Still further funds will also be needed for AVLIS. And, as the Clean Air Act increases the price of electricity, DOE's SWU production costs will also rise, even as the availability of cheap, off-peak power declines.

Where will the money come from? As seen, higher SWU prices are not an answer, for higher prices, coupled with DOE's chronic inflexibility, will only lead to further customer defections and further reduction of the revenue stream. And, I doubt, in the current political environment, that taxpayers will be asked to foot the bill directly. Consequently, I'm forced to the conclusion that somehow, someway, US nuclear utilities are the obvious candidates to end up holding the bag. A usage fee, a service charge, or some similar special levy—perhaps 1, 2, or 3 mills per kilowatt hour—will appear one day, likely with little or no advance notice.

DOE proposes to solve all its money problems by turning itself into a government corporation, arguing that in a corporate form the enrichment business would be removed from the cumbersome Congressional appropriation process and would be able to do all those things that normal businesses do, including, most importantly, borrowing money. Legislation establishing such a corporation has passed the Senate several times in prior years, but each year it has died in the House, and chances for enacting the legislation this year don't seem much better.

The legislation has lacked support because it does not appear to provide any tangible benefits to enrichment customers. It has also been characterized as a transparent attempt by DOE to get out from under its most onerous financial burdens, and gain its own direct access to capital markets. And, so the debate rages. In fact, DOE's recent actions, or perhaps I should say inactions, including delays in the deployment of its new AVLIS technology, could lead one to conclude, without undue cynicism, that DOE has created its own crisis, purposefully making a shambles of its business to impress upon the Congress the severity of the situation and the need for passage of the enrichment legislation.

Such an approach is fraught with danger for both DOE and its customers. By tossing the problem into Congress' lap, they risk losing all control over the outcome. Political rather than market considerations may dominate. There are those in the Congress who believe that DOE should be out of the enrichment business entirely by the turn of the century. Even that would be acceptable, if reliable, alternate supply is available on a timely basis. But no such supply is currently in sight. The US enrichment enterprise is aging, high cost, not licensable under current regulations, deeply in debt, and, to date, without a successor technology.

Let me also make brief mention of another aspect of this situation—what I choose to call the "image problem." The environmental issues and costs associated with the eventual cleanup of the three gaseous diffusion plants, as well as such defense-related facilities as Hanford, Savannah River, and Fernald, are going to loom large and prove very troublesome as the media and the public come to understand the magnitude of the problem. This situation is sure to generate a great deal of negative press and stir up a considerable emotion; fairly or not, the local nuclear utility will end up as the villain.

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In summary, the enrichment market is troubled, because DOE, its biggest player, has big problems. However, using a medical analogy, it is often easier to recognize that someone is sick, than to prescribe an appropriate cure. But, to continue that analogy, accurate diagnosis is a necessary precursor to successful treatment; hence my admonition that utility management get smarter about enrichment.

A COMMERCIAL COMMENT

Having been a salesman for more than 25 years and having been with NUEXCO for nearly 20, I cannot let this opportunity pass without offering at least some commercial observations. Early on in the nuclear game—in the late-1960s and early-1970s—vendors were selling the utilities not only nuclear reactors and turbine generator sets but also fabricated fuel. In time, two trends emerged. First, the utilities, believing it was prudent for them to have more control of their fuel procurement schedules and practices, elected to unbundle nuclear fuel into its component parts—uranium, conversion, enrichment, and fabrication. They also wanted to save money by buying uranium, conversion, and enrichment directly from primary suppliers rather than purchasing it through fuel vendors in the form of fabricated fuel. Concurrently, the fuel vendors recognized that their technical expertise in fabrication was not matched by similar expertise in purchasing and reselling uranium, conversion, and enrichment.

So the utilities took over this purchasing—uranium from uranium producers, conversion from convertors, and enrichment from DOE (and its predecessors AEC and ERDA). The catch phrase was "security of supply via long-term contracts with responsible suppliers." Needless to say, such contracts commanded premium prices. In the uranium market, the rationale for such a premium was based on the fact that published spot prices, primarily the NUEXCO Exchange Value, related only to a minor portion of the uranium market—perhaps only five percent—and were not indicative of the "real" price of uranium.

To the dismay of most uranium producers, this point of view did not prevail. The spot uranium market continued to grow in both size and importance, exerting ever-increasing influence on long-term pricing. The past ten years has also witnessed the development of spot and secondary markets for conversion and enrichment services. In fact, it would be my view that all three—uranium, conversion, and enrichment—have become commodities. In addition to NUEXCO, five other organizations now publish uranium prices on a regular basis; two publish conversion prices, and three publish enrichment prices. Fabrication has not, however, gone through the same process. Technology is not easily commodified.

With the development of well-defined markets and recognized pricing systems for uranium, conversion, and enrichment, it is not surprising that we have seen the beginning of a movement toward bundling them together once again, creating a new commodity—enriched uranium product or EUP. A senior fuel manager expressed to me as follows:

> George, if I could get someone to take over all my individual uranium, conversion, and enrichment contracts, and, instead, deliver market-priced EUP to me at my fabricator, I could save a ton of money. I could reassign a number of my people now involved in nuclear fuel analysis and procurement to other activities. In addition, I could avoid the carrying charges associated with acquiring nuclear materials and services prior to the date of actual need.

He is, of course, right, but who is that brave someone? The logical parties are the fuel fabricators, but, as noted earlier, they have come to recognize that their forte is technology, not commodity trading. That really leaves only the trading companies. Indeed, I suggest a persuasive case can be made that a trading company, through its worldwide affiliations, can provide greater security of supply than can any *individual* uranium producer, convertor, or enricher. If the truth be known, nuclear utilities don't care a whit about uranium, conversion, or enrichment per se; they do care about having EUP at their fabricators on time. In fact, security of supply becomes meaningless when any single party in the nuclear fuel cycle chain fails to perform. Contrast this with a trading company which has continuing access to multiple supply sources at each step in the fuel cycle. Thank You.

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NUCLEAR INDUSTRY CALENDAR

1991

June 23-26 ***International Conference on Enrichment*** (The Westin Hotel, Washington, DC).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Sept. 4-6 ***Uranium Institute Sirteenth Annual Symposium*** (London, UK).
Contact: Uranium Institute; 44-71-225-0303; or Fax: 44-71-225-0308.

Sept. 22-25 ***International Uranium Seminar '91*** (The Don Cesar Hotel, St. Petersburg/Tampa, Florida).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Sept. 29-Oct. 2 ***American Mining Congress Mining Convention*** (Salt Lake City, Utah).
Contact: AMC Convention Office: 202-861-2800; or Fax: 202-861-7535.

Oct. 29-31 ***Uranium Hexafluoride Handling*** (William G. Pollard Auditorium, Oak Ridge, Tennessee).
Sponsored by Martin Marietta Energy Systems, Inc.
Contact: Diane Duck, MMES, 615-576-1676; or Fax: 615-576-1561.

Nov. 10-13 ***Nuclear Energy Forum*** (Westin St. Francis Hotel, San Francisco, California).
Sponsored by the U.S. Council for Energy Awareness.
Contact: USCEA Conference Office; 202-293-0770; Telex: 7108249602; Fax: 202-785-4113.

Nov. 10-15 ***American Nuclear Society Winter Meeting*** (Hilton Hotel, San Francisco, California).
Contact: ANS Meetings Department; 708-352-6611.

1992

April 12-16 ***8th Pacific Basin Conference*** (Taipei, Taiwan).
Sponsored by the Amercian Nuclear Society.
Contact: ANS Meetings Department; 708-352-6611.

Sept. 21-23 ***Second International Conference on Training for Operation & Maintenance in the Nuclear Industry***
(The Moat House International Hotel, Stratford-upon-Avon, United Kingdom).
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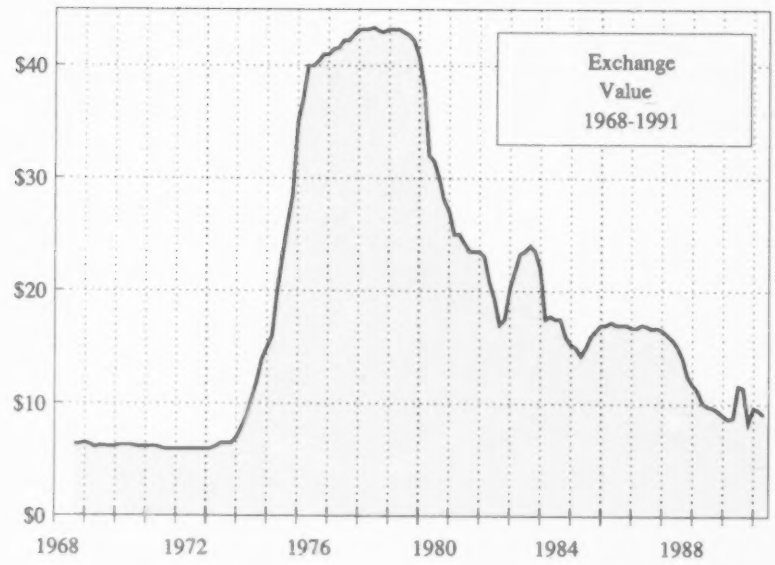
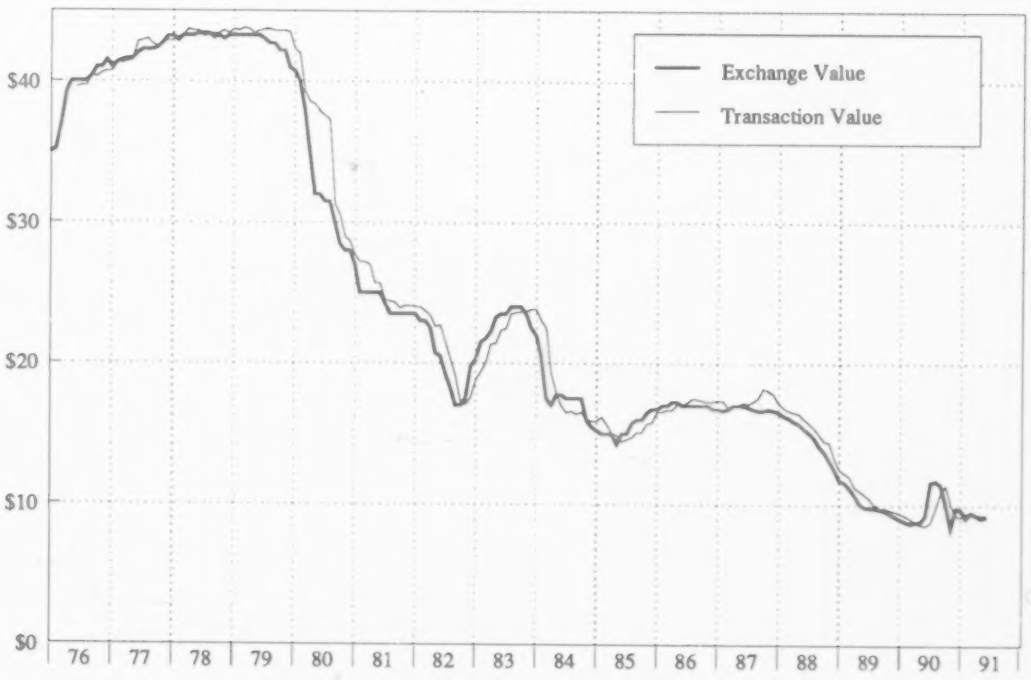
HISTORICAL MARKET DATA

NUEXCO Historical Exchange Value and Transaction Value
(in US dollars per Pound U_3O_8)





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HISTORICAL MARKET VALUES

Exchange Values

Year	Determined as of the last day of the month indicated ($US/lb U_3O_8)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	17.25	17.00	17.00	17.00	17.00	17.00	17.00	16.75	16.75
1987	16.65	16.75	17.00	17.00	17.00	16.90	16.75	16.65	16.65	16.75	16.65	16.55
1988	16.30	16.15	15.90	15.75	15.40	15.10	14.75	14.15	13.75	13.15	12.50	11.75
1989	11.60	11.20	10.70	10.10	9.85	9.80	9.80	9.70	9.60	9.40	9.20	9.00
1990	8.85	8.70	8.80	8.80	9.25	11.60	11.70	11.45	10.10	8.35	9.80	9.70
1991	9.10	9.50	9.30	9.10	**9.20**							

US Premium (Relative to the Exchange Value)

Year	Determined as of the last day of the month indicated ($US/lb U_3O_8)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	0.65	0.75
1987	0.85	1.00	1.50	1.50	0.90	0.60	2.50	2.35	2.10	1.65	0.85	0.65
1988	0.70	0.50	0.15	0.25	0.60	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

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HISTORICAL MARKET DATA

UF_6 Values

Year	Determined as of the last day of the month indicated ($US/kg U as UF_6)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1985	—	—	—	40.50	42.50	42.50	44.00	44.50	44.50	46.00	46.00	47.00
1986	47.00	48.00	48.00	48.50	48.25	48.25	48.25	48.00	48.00	48.00	48.00	47.75
1987	47.75	48.00	48.00	48.00	47.75	47.75	47.50	47.00	46.75	47.00	47.00	47.00
1988	46.50	46.00	45.50	45.25	44.75	44.00	42.75	41.00	40.75	39.00	37.50	35.50
1989	34.75	34.00	33.00	30.50	30.25	30.25	30.00	29.75	29.75	28.25	27.75	26.50
1990	25.90	25.25	24.40	24.40	25.50	32.00	32.50	32.25	29.50	24.75	28.75	28.75
1991	27.50	27.75	27.50	27.25	**27.60**							

US Premium (Relative to the UF_6 Value)

Year	Determined as of the last day of the month indicated ($US/kg U as UF_6)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	2.50	2.50
1987	2.50	2.50	3.50	3.00	2.25	1.75	6.50	6.00	4.25	3.10	2.25	2.00
1988	1.25	1.25	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	**Discontinued**	

Conversion Values

Year	Determined as of the last day of the month indicated ($US/lb U as UF_6)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.90	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.80	1.80
1987	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.90	1.90	1.90
1988	1.90	1.80	1.80	1.80	1.80	1.80	1.85	1.95	1.95	1.95	1.95	1.95
1989	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90	1.80	1.75	1.65
1990	1.50	1.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
1991	1.45	1.45	1.45	1.45	**1.50**							

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Transaction Values

Determined as of the last day of the month indicated ($US/lb U_3O_8)

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	17.10	17.15	17.20	17.50	17.45	17.35	17.25	17.30	17.35
1987	17.35	16.90	16.95	17.00	17.20	17.10	17.30	17.55	18.20	18.05	17.80	17.20
1988	16.85	16.65	16.55	16.45	16.10	15.80	15.45	15.00	14.50	14.40	13.30	12.50
1989	12.25	12.00	11.25	11.00	10.75	10.45	9.95	9.80	9.80	9.65	9.55	9.40
1990	9.25	9.05	8.75	8.65	8.55	8.80	9.75	10.80	11.40	10.10	9.30	9.15
1991	9.40	9.45	9.35	9.30	**9.30**							

SWU Values

Determined as of the last day of the month indicated ($US per SWU)

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1986	80	80	80	80	75	78	78	78	78	78	80	80
1987	80	80	77	77	75	73	75	75	73	69	73	73
1988	73	73	70	68	68	68	68	65	65	65	65	65
1989	65	67	67	67	66	66	66	65	63	59	57	54
1990	54	50	50	50	50	50	50	50	50	51	51	51
1991	51	50	52	52	**54**							

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HISTORICAL MARKET DATA

Loan Rates

Year	Determined as of the last day of the month indicated (Percent per Annum)											
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	4.00	4.00	4.00	4.00	4.00
1969	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	6.00
1970	6.00	6.20	6.40	6.50	6.50	6.50	6.50	5.00	6.50	6.00	5.50	5.50
1971	5.00	4.75	4.75	4.75	5.00	5.25	5.25	5.25	5.25	5.25	4.50	4.50
1972	4.00	4.00	4.00	4.50	4.50	4.50	5.00	5.00	5.00	5.00	5.00	5.00
1973	5.50	5.50	5.75	5.75	6.00	6.25	7.00	7.00	7.00	7.00	7.50	8.00
1974	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
1975	8.00	7.00	7.00	7.00	7.00	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1976	6.50	6.50	6.50	6.50	*	*	*	*	*	*	*	*
1977	*	*	*	*	6.50	6.50	6.50	6.75	7.25	7.25	7.25	7.25
1978	7.25	7.00	7.00	7.00	7.00	7.50	7.75	7.75	7.75	7.00	7.00	7.00
1979	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1980	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1981	7.00	7.00	7.00	7.00	7.00	5.50	5.50	5.50	5.50	6.00	6.00	6.00
1982	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1983	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1984	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1985	6.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1986	5.00	5.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
1987	3.00	3.00	3.00	3.00	3.00	3.00	3.00	4.00	4.00	4.00	3.50	3.50
1988	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1989	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1990	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1991	3.50	3.50	3.50	3.50	**3.50**							

* Float with Prime Rate

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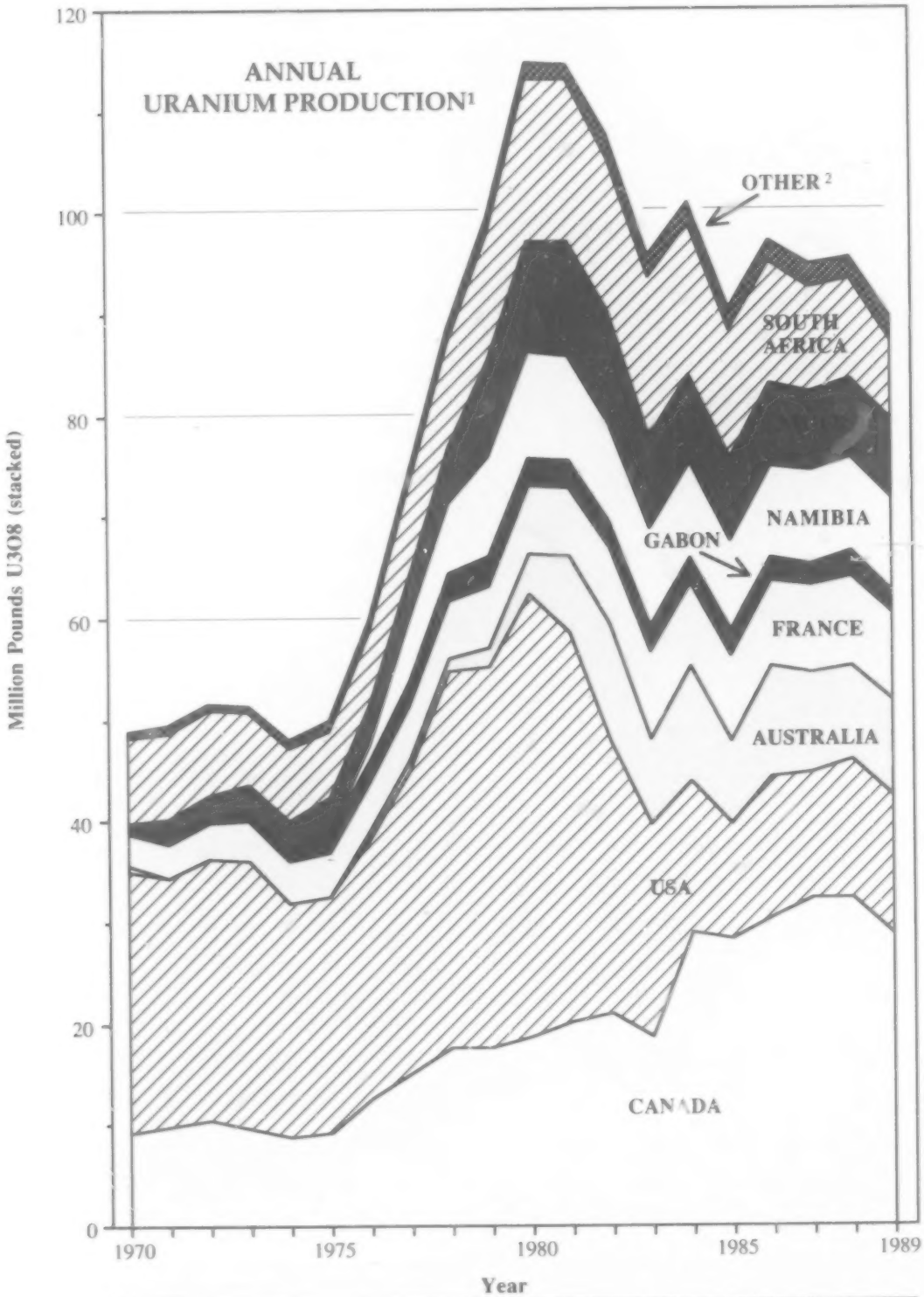

[1] Estimated world production in 1989 totalled 89.6 million pounds (Australia—9.5; Canada—28.7; France—8.5; Gabon—2.2; Namibia—9.2; Niger—7.7; South Africa—7.7; USA—13.7; Others[2]—2.3)

[2] **Other** includes: Argentina, Belgium, Brazil, India, Pakistan, Portugal, Spain, (West) Germany, and Yugoslavia

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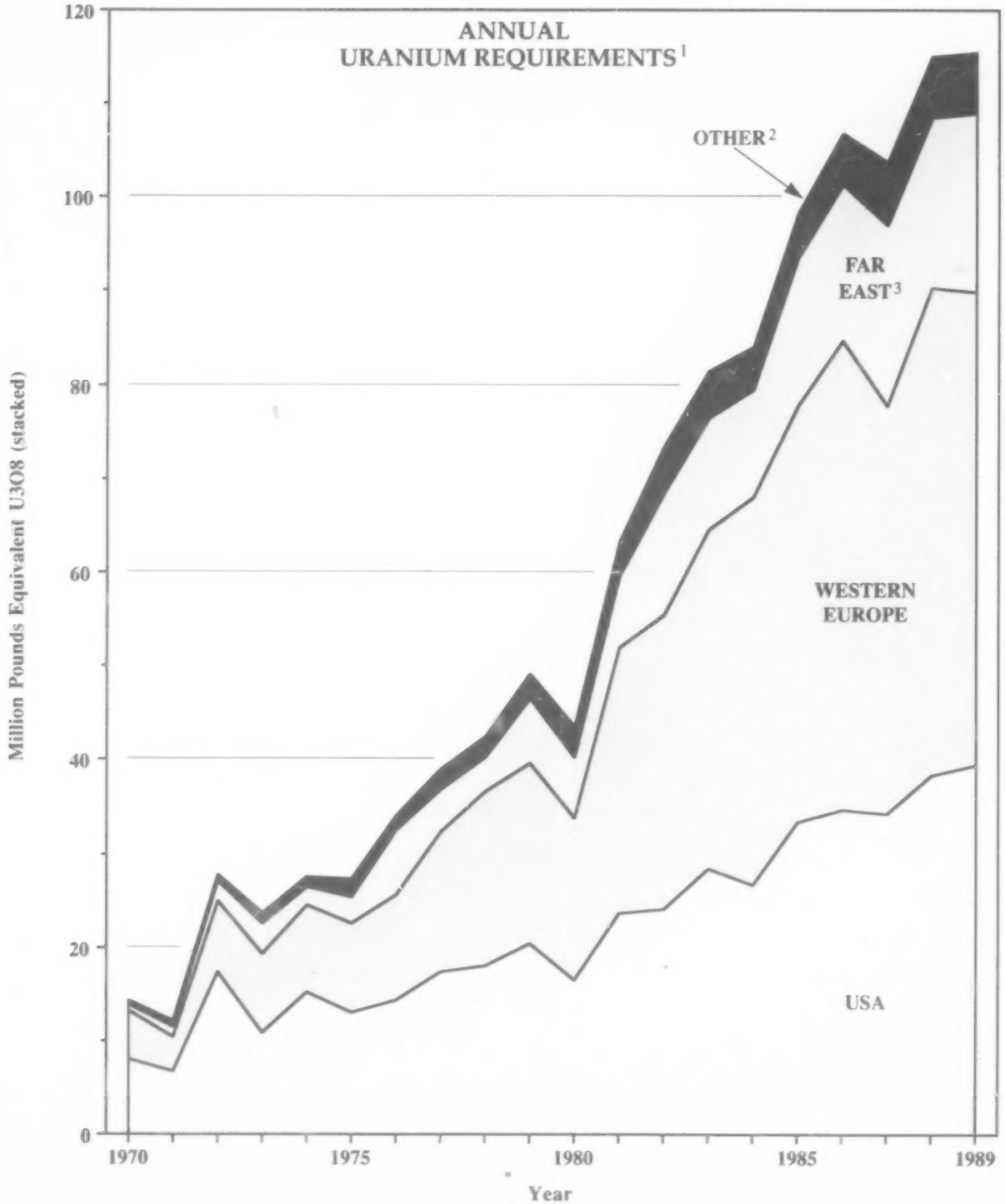
HISTORICAL MARKET DATA



[1] Calculated by NUEXCO based on actual completion dates and operating performance, and NUEXCO's estimate of enriching tails assays.

[2] **Other** include: Argentina, Brazil, Canada, India, Mexico, Pakistan and South Africa.

[3] Does not include Peoples Republic of China.

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Australia

Year	Period [1]	Consumer Price Index [2] (1980/1981 = 100)	Price Index of Materials Used in Manufacturing Industry — All Groups [3] (1984/1985 = 100)	Average Weekly Ordinary Time Earnings — Adult Males — Australia [4] (Australian dollars)	Award Rates of Pay Indexes Australia - Adult Males In Mining Wage Earners, Weekly Rates [5] (June 1985=100)
1980	Avg.	95.8	83.1	—	140.8 [6]
1981	Avg.	105.0	85.9	—	154.1 [6]
1982	Avg.	116.7	89.0	—	174.9 [6]
1983	Avg.	128.5	96.9	—	181.9 [6]
1984	Avg.	133.6	98.0	—	194.4 [6]
1985	Avg.	142.6	107.3	—	103.7
1986	Avg.	155.5	101.5	—	106.1
1987	Avg.	168.7	108.9	465.88	112.3
1988	Avg.	180.9	111.8	496.90	115.2
1989	Avg.	194.6	117.0	534.65	126.0
1990	Avg.	208.7	123.4	571.43	129.6 R
Jan	1990	—	119.2	—	128.3
Feb	1990	—	120.8	555.80	128.3
Mar	1990	204.1	121.5	—	128.7 R
Apr	1990	—	119.9	—	129.0 R
May	1990	—	118.9	566.60	129.2 R
June	1990	207.4	116.6	—	129.7 R
July	1990	—	116.4	—	129.9 R
Aug	1990	—	122.4	574.10	130.1 R
Sept	1990	208.9	128.2	—	130.4 R
Oct	1990	—	134.1	—	130.5 R
Nov	1990	—	133.7	589.20	130.4 R
Dec	1990	214.5	128.8	—	130.5 R
Jan	1991	—	125.6	—	130.5 R
Feb	1991	—	121.5	—	130.4 R
Mar	1991	214.1	—	—	130.5

P = Preliminary **R** = Revised since last month

[1] Monthly data for the period 1967 to 1986 appears in Report 233 (January 1988).
[2] Weighted average of six State capital cities (1975 to 1980), and eight capital cities from 1981 (Base: Financial year July 1980 to June 1981 = 100.0). Figures shown at end of quarter represent quarterly average.
[3] Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).
[4] Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.
[5] Australian Bureau of Statistics, Canberra: "Average Weekly Earnings, States & Australia" (Catalogue No. 6302.0).
[6] Base: June 1976 = 100.

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GOVERNMENT STATISTICS

Canada

		Industrial Products Price Index: All Commodities [1] (1986 = 100) [2]	Consumer Price Index: All Items (1986 = 100) [3]	Wage-earner Data: Average Hourly Earnings (C$) [4] Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells (SIC 051-099)	Metal Rolling, Casting and Extruding (SIC 298)	Chemicals and Chemical Products Industries (SIC 372-379)
1980	Avg.	75.7	67.1	–·–	–·–	–·–	–·–	–·–
1981	Avg.	83.4	75.5	–·–	–·–	–·–	–·–	–·–
1982	Avg.	89.0	83.7	–·–	–·–	–·–	–·–	–·–
1983	Avg.	92.1	88.5	17.22	–·–	14.18	10.67	11.10
1984	Avg.	96.3	92.3	17.89	–·–	14.97	11.11	11.68
1985	Avg.	99.0	96.0	18.53	16.48	15.56	11.85	12.12
1986	Avg.	100.0	100.0	19.38	16.70	15.76	12.28	12.58
1987	Avg.	102.4	104.4	20.12	17.15	16.11	12.58	13.20
1988	Avg.	106.9	108.6	20.91	18.51	16.95	13.17	13.77
1989	Avg.	109.4	114.0	21.97	20.02	18.41	13.71	14.16
1990	Avg.	109.8	119.4	22.90	20.93	19.12	14.62	15.28
Jan	1990	108.7	116.9	21.88	20.39	19.03	13.99	14.78
Feb	1990	109.5	117.6	22.51	20.63	19.14	14.49	15.03
Mar	1990	109.3	118.0	22.52	20.75	19.17	14.99	15.07
Apr	1990	109.1	118.1	23.17	21.20	19.46	14.83	14.93
May	1990	109.6	118.7	23.28	20.55	19.01	14.71	15.06
June	1990	109.4	119.2	21.85	20.63	18.96	14.69	15.05
July	1990	109.1	119.8	20.92	20.18	18.66	14.34	15.20
Aug	1990	109.3	119.8	23.88	20.51	18.59	14.50	15.33
Sept	1990	110.2	120.2	24.41	21.19	18.94	14.48	15.63
Oct	1990	110.6	121.2	23.11	21.39	19.12	14.78	15.59
Nov	1990	110.9	121.9	23.38	21.83	19.48	14.93	15.73
Dec	1990	110.9	121.8	23.90	21.89	19.88	14.7	16.01
Jan	1991	111.2R	125.0	23.79	21.79	19.78	14.66	15.89
Feb	1991	110.6R	125.0	25.23R	22.45R	20.13R	14.63R	16.10R
Mar	1991	110.0R	125.5	25.3[illegible]P	22.69P	20.43P	15.28P	16.41P
Apr	1991	109.7	125.5	–·–	–·–	–·–	–·–	–·–

P = Preliminary R = Revised since last month

[1] Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Monthly data for the period 1967 to 1986 is found in Report 233.

[2] New Base Year of 1986 as of Report 266. Previous Base Year was 1981. All figures in column recalculated by 0.791 multiplier.

[3] New Base Year of 1986 as of Report 264. Previous Base Year was 1981. All figures in column recalculated by 0.755 multiplier.

[4] Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours." Monthly data for the period 1983 to 1986 is found in Report 233.

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South Africa

		Average Declared Working Costs per Metric Ton of Gold Ore Milled [1] (Rand)	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled [2] (March 1982 = 100)	Consumer Price Index [3] (1985 = 100)	Production Price Index All Groups [4] (1985 = 100)	Total Employment in Mining and Quarrying [5]	Total Salaries and Wages in Mining and Quarrying [5] (1,000 Rand)
							Annual Total [6]
1980	Avg.	35.53	—	51.9	55.2	709,042	2,237,689
1981	Avg.	41.89	—	59.8	62.7	722,918	2,756,928
1982	Avg.	47.25	104.2	68.6	71.4	702,041	3,181,584
1983	Avg.	51.88	115.0	77.1	79.0	700,901	3,563,282
1984	Avg.	58.95	130.3	86.0	85.6	711,511	4,134,390
1985	Avg.	68.76	151.6	100.0	100.0	724,587	4,778,612
1986	Avg.	80.22	177.9	118.6	119.5	756,637	5,767,950
1987	Avg.	95.01	223.1	137.7	136.2	751,864	6,911,395
1988	Avg.	106.69	241.1	155.4	154.1	705,355	7,774,054
1989	Avg.	116.65	273.0	178.2	177.5	700,360	8,833,934
1990	Avg.	129.37	305.3	203.8	199.4	677,742	10,193,209
							Monthly Total
Jan	1990	—	—	192.0	188.8	688,837	801,616
Feb	1990	—	—	193.3	190.3	674,026	767,274
Mar	1990	126.74	296.3	196.4	190.9	704,660	780,614
Apr	1990	—	—	198.3	194.1	696,107	810,474
May	1990	—	—	200.4	196.3	613,527	719,191
June	1990	128.25	299.87	201.8	197.0	676,621	841,165
July	1990	—	—	203.2	197.2	697,242	913,177
Aug	1990	—	—	206.5	199.8	686,385	902,392
Sept	1990	129.46	312.55	209.7	203.2	689,317	922,454
Oct	1990	—	—	211.1	206.1	676,833	882,603
Nov	1990	—	—	215.6	214.9	669,198	909,418
Dec	1990	133.02	312.37	217.1	214.7	660,151	942,831
Jan	1991	—	—	219.5	218.0	648,944	935,839
Feb	1991	—	—	222.2	219.3	—	—
Mar	1991	137.66	323.82	224.1	218.5	—	—
Apr	1991	—	—	227.3	—	—	—

P = Preliminary R = Revised since last month

[1] Chamber of Mines of South Africa, Johannesburg: "Analysis of Working Results," published quarterly. Historical Data by month appears in Report 236.

[2] Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.

[3] Central Statistical Service, Pretoria: All income groups-weighted average, Historical Data by month appears in Report 236.

[4] Central Statistical Service, Pretoria: All commodities for consumption in South Africa.

[5] Central Statistical Service, Pretoria: Historical Data by month appears in Report 236.

[6] Annual total is shown, rather than monthly average, for indicated year.

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GOVERNMENT STATISTICS

United States

		Producer Price Index[1]		Consumer Price Index[2]	GNP Implicit Price Deflator[3]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
		Industrial Commodities (1982 = 100)	All Commodities (1982 = 100)	(1982-1984 = 100)	(1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980	Avg.	88.0	89.8	82.4	85.7	10.26	10.63	8.30	6.94
1981	Avg.	97.4	98.0	90.9	94.0	11.55	11.98	9.12	7.62
1982	Avg.	100.0	100.0	96.5	100.0	12.31	12.93	9.96	8.21
1983	Avg.	101.1	101.3	99.6	103.9	12.58	13.43	10.58	8.67
1984	Avg.	103.3	103.7	103.9	107.7	13.05	13.43	11.07	9.04
1985	Avg.	103.7	103.2	107.6	110.9	13.38	13.74	11.56	9.46
1986	Avg.	100.0	100.2	109.6	113.9	12.46	13.48	11.98	9.65
1987	Avg.	102.6	102.8	113.6	117.7	12.52	12.98	12.37	9.88
1988	Avg.	106.3	106.9	118.3	121.3	13.24	13.26	12.71	9.79
1989	Avg.	111.6	112.2	124.0	126.3	13.59	13.72	13.09	10.05
1990	Avg.	115.8	116.3	130.7	131.5	14.10	14.36	13.54	10.37
Jan	1990	114.1	114.9	127.4	—	13.69	13.95	13.34	10.13
Feb	1990	113.6	114.4	128.0	—	13.70	13.99	13.27	10.16
Mar	1990	113.2	114.2	128.7	129.5	13.80	14.04	13.34	10.17
Apr	1990	113.2	114.1	128.9	—	13.92	14.30	13.53	10.17
May	1990	113.5	114.6	129.2	—	13.96	14.16	13.46	10.22
June	1990	113.2	114.3	129.9	131.0	14.00	14.31	13.51	10.27
July	1990	113.4	114.5	130.4	—	14.29	14.49	13.58	10.34
Aug	1990	115.9	116.5	131.6	—	14.27	14.60	13.57	10.33
Sept	1990	118.4	118.4	132.7	132.2	14.41	14.48	13.62	10.42
Oct	1990	121.4	120.8	133.5	—	14.43	14.58	13.72	10.47
Nov	1990	120.7	120.1	133.8	—	14.34	14.73	13.73	10.53
Dec	1990	119.0R	118.7R	133.8	133.1	14.39	14.69	13.75	10.57
Jan	1991	118.3	118.9	134.6	—	14.73	14.63	13.85	10.60
Feb	1991	117.2	117.2	134.8	—	14.80R	14.55R	13.81R	10.59R
Mar	1991	115.6	116.1	135.0	134.8R	14.91P	14.57P	13.84R	10.56R
Apr	1991	115.5	116.0	135.2	—	– · –	– · –	13.97P	10.60P

P = Preliminary R = Revised since last month

[1] US Bureau of Labor Statistics, Washington, DC: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents. Historical data is presented in Report 233.

[2] US Bureau of Labor Statistics, Washington, DC: Consumer Price Index for All Urban Consumers, US City Average, All Items. Historical data is presented in Report 233.

[3] US Department of Commerce, Washington, DC: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted. Historical data is presented in Report 233.

[4] US Bureau of Labor Statistics, Washington, DC: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Historical data is presented in Report 233.

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Volume and Price of Uranium Deliveries To The European Community [1]

— Compiled from data published by the Euratom Supply Agency —

Year	Volume of Deliveries to the EC [2] (MTU)	Percentage of Deliveries Made Under Spot Contracts	Medium or Long-Term Contracts [3] Average Price		Spot Contracts [3] Average Price	
			in ECU per pound U_3O_8	in US Dollars per pound U_3O_8	in ECU per pound U_3O_8	in US Dollars per pound U_3O_8
1977	n/a	n/a	n/a	n/a	n/a	$41.00
1978	n/a	n/a	n/a	n/a	n/a	$43.00
1979	10,000	n/a	n/a	n/a	n/a	$44.50
1980	8,600	n/a	n/a	$36.00	n/a	$35.00
1981	13,000	less than 10	n/a	$33.25	n/a	$28.00
1982	12,500	less than 10	ECU 32.25	$32.00	ECU 24.25	$24.00
1983	13,500	less than 10	ECU 34.75	$31.00	ECU 26.00	$23.25
1984	11,000	less than 10	ECU 37.75	$29.75	ECU 24.50	$19.25
1985	11,000	11.5	ECU 38.00	$29.00	ECU 19.50	$15.00
1986	12,000	9.5	ECU 31.50	$31.00	ECU 18.00	$17.75
1987	14,000	17.0	ECU 28.25	$32.50	ECU 15.00	$17.25
1988	12,500	4.5	ECU 26.92	$31.82	ECU 13.65	$16.13
1989	13,500	11.5	ECU 26.63	$29.35	ECU 11.04	$12.19

P = Preliminary **R** = Revised since last month

[1] The twelve European Community member nations are Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, and the United Kingdom; prior to January 1986, Spain and Portugal were not members of the EEC.

[2] The only deliveries taken into account are those made to final users, namely the electric utilities or their procurement organizations; deliveries to middlemen or fuel cycle companies are not included. The sales between utilities in the Community are also excluded. The quantities covered are those which were entered into accounting records during the year stated.

[3] For deliveries made under medium or long-term contracts (i.e., for which the time between the date of signature and the date of the last delivery exceeds one year) the prices were expressed in seven different currencies. In order to calculate an average price, these prices have been converted into European Currency Units (ECU) and US dollars. The average prices were weighted by quantity and converted on the basis of the average annual exchange rate of the different currencies against the ECU and US dollar. Exchange rates are published by European Communities Statistical Office and the International Monetary Fund.

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GOVERNMENT STATISTICS

US Uranium Marketing Activities Statistics

— Compiled from data published by the US Energy Information Administration [1] —

Year	Total Production (million pounds U_3O_8)	Deliveries to Domestic Utilities From US Suppliers [2] (million pounds U_3O_8)	Average Price of Delivered Uranium [2] ($/lb. U_3O_8)	Quantity of Uranium Imported [3] (million pounds U_3O_8)	Average Price of Imported Uranium ($/lb. U_3O_8)	Quantity of Uranium Exported (million pounds U_3O_8)
1976	25.5	27.6	$16.10	3.6	n/a	1.2
1977	29.9	27.8	$19.75	5.6	n/a	4.0
1978	37.0	31.6	$21.60	5.2	n/a	6.8
1979	37.5	33.0	$23.85	3.0	n/a	6.2
1980	43.7	35.0	$28.15	3.6	$43.10	5.8
1981	38.5	32.6	$34.65	6.6	$32.90	4.4
1982	26.9	23.5	$38.37	17.1	$25.19	6.2
1983	21.2	24.2	$38.21	8.2	$26.16	3.3
1984	14.9	22.5	$32.65	12.5	$21.86	2.2
1985	11.3	21.7	$31.43	11.7	$20.08	5.3
1986	13.5	18.9	$30.01	13.5	$20.07	1.6
1987	13.0	20.8	$27.37	15.1	$19.14	1.0
1988	13.1	17.6	$26.15	15.8	$19.03	3.3
1989	13.8	18.4	$19.56	13.1	$16.75	2.1

P = Preliminary R = Revised since last month

[1] Sources: 1976-1983: US Department of Energy/Energy Information Administration, *Survey of United States Marketing Activity*.
1984-1989: Energy Information Administration, *Uranium Industry Annual*.

[2] Data for 1976-1981 includes both domestic utilities and agents.

[3] Includes imports by domestic utilities and domestic suppliers.

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